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APPLICANT: **Monsanto Australia Limited**

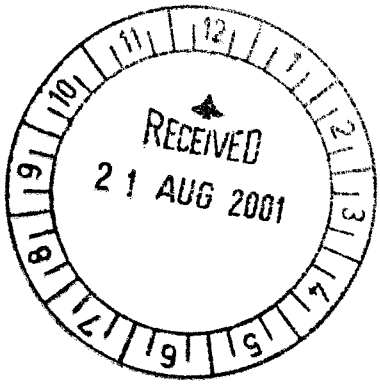
A416
CP4 ESPS gene in Roundup Ready® Corn Line NK603

SUBMISSION: Application to Australia New Zealand Food Authority for the inclusion of corn containing the CP4 EPSPS gene by Monsanto in Standard A18 - Food Derived From Gene Technology

VOLUME: 1 of 1

SUPPORTING INFORMATION

DATE: 21 August 2001



PREPARED BY: Megan Shaw
Regulatory Product Manager

Study Title

Confirmation of the Genomic DNA Sequences Flanking the 5' and 3' Ends of the Insert in Roundup Ready® Corn Event NK603

Authors

Tracey A. Cavato
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Ronald P. Lirette

Report Completed

October 12, 2000

Performing Laboratory

Monsanto Company
Product Characterization Center
Biotechnology Regulatory Sciences
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Laboratory Project ID

Study 00-01-46-30
MSL-16857

[redacted]

Company: Monsanto Company

Company Agent: _____

Title: _____

Signature: _____ Date: _____

Statement of Compliance

This study meets the requirements under GLP as specified in 40 CFR Part 160 with the following exception:

Sequence information, generated by the Monsanto Genomic Sequencing Center, was not generated in compliance with the GLP regulations, however all experiments performed to confirm sequence data within this report were performed in compliance with the GLP regulations.

Submitter	Date
Linda K. Johnson	10/12/00
Sponsor	Date
Tracey A. Cavato	October 12, 2000
Study Director	Date

Quality Assurance Statement

Reviews conducted by the QAU confirm that the final report reflects the raw data.

Following is a list of reviews conducted by the Monsanto Regulatory QAU on the study reported herein.

Dates Of Inspection / Audit	Phase	Date Reported To: Study Director	Management
August 14, 2000	PCR	August 14, 2000	August 14, 2000
August 14, 2000	Agarose Gel Electrophoresis	August 14, 2000	August 14, 2000
August 30, 2000	Raw Data Audit	August 30, 2000	August 30, 2000
October 12, 2000	Raw Data/Draft Report Audit	October 12, 2000	October 12, 2000

Joan M. Rejda-Heath
Joan Rejda-Heath, Ph.D
Quality Assurance Specialist
Monsanto Regulatory, Monsanto Company

October 12, 2000
Date

Signatures of Approval

Study Title:	Confirmation of the Genomic DNA Sequences Flanking the 5' and 3' Ends of the Insert in Roundup Ready Corn Event NK603
Primary Facility:	Monsanto Company 700 Chesterfield Parkway North St. Louis, MO 63198
Monsanto Genome Sequencing Center:	Monsanto Company Genomics Sequencing Center 800 North Lindbergh Boulevard St. Louis, MO 63167
Sponsor Representative:	Linda K. Lahman
Study Director:	Tracey A. Cavato
Contributors:	Ming Y. Deng, Jinsong You, Gregory Heck, and Ronald P. Lirette
Study Initiation Date:	August 8, 2000
Report Completion Date:	October 12, 2000
Records Retention:	All study specific raw data, protocols, and final reports and facility records will be retained at Monsanto, St. Louis.

Signatures of Approval:

Tracey A. Cavato — October 12, 2000
Study Director — Date

Linda K. Lahman — 10/12/00
Sponsor Representative — Date

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Abbreviations

~	approximately
CaMV	cauliflower mosaic virus
CP4 EPSPS	enzyme 5-enolpyruvylshikimate-3-phosphate synthase isolated from *Agrobacterium* sp. strain CP4
CTAB	cetyltrimethylammonium bromide
CTP2	chloroplast transit peptide
DNA	deoxyribonucleic acid
dNTP	deoxynucleotide triphosphate
e35S	cauliflower mosaic virus promoter with the duplicated enhancer region
EDTA	ethylenediaminetetraacetic acid
Mg^{2+}	magnesium
MW	molecular weight
NaCl	sodium chloride
NOS 3'	nopaline synthase 3' polyadenylation sequence
PCR	polymerase chain reaction
P-ract1	rice actin promoter
ract1 intron	rice actin intron
PVP	polyvinylpyrrolidone
TE buffer	Tris-EDTA buffer (10mM Tris, pH 8.0, 1mM EDTA)
Tris	tris(hydroxymethyl)aminomethane
*Zm*HSP70	maize (*Zea mays*) *hsp*70 gene (heat-shock protein)

I. SUMMARY

The molecular characterization of Roundup Ready® corn event NK603 has been previously described in detail (Deng *et al.*, 1999). This characterization demonstrated that one complete copy of the DNA fragment used for transformation was present in the genome of corn event NK603, along with a 217-bp segment containing a portion of the enhancer region of the rice actin promoter inversely linked to the 3' end of the inserted transformation cassette. PCR analysis was also performed as part of that characterization to verify the maize genomic sequences flanking the 5' and 3' ends of the insert. In order to further confirm the 5' and 3' genomic DNA sequences flanking the 5' and 3' ends of the NK603 insert, PCR and subsequent DNA sequence analysis of the PCR products were performed in the current study. DNA sequences of the 5' and 3' ends of the insert, as well as the corn genomic DNA sequences flanking the 5' end (308 bp) and 3' end (497 bp) of the insert in event NK603 are described in this report.

II. INTRODUCTION

A. Background.

Roundup Ready corn event NK603 was generated through particle acceleration using a 6.7-Kb agarose gel-isolated *Mlu* I restriction fragment from the plasmid vector PV-ZMGT32. The DNA fragment used for transformation contained two gene expression cassettes: an EPSPS cassette containing the CP4 EPSPS coding sequence under the regulation of the rice actin promoter (P-ract1), a rice actin (ract1) intron, a chloroplast transit peptide (CTP2) sequence, and a nopaline synthase (NOS) 3' polyadenylation sequence; and a second EPSPS cassette containing the CP4 EPSPS coding sequence under the regulation of the cauliflower mosaic virus (CaMV) enhanced 35S plant promoter (e35S), a maize heat-shock protein 70 (*Zm*HSP70) intron, CTP2, and the NOS 3' polyadenylation sequence. Previous molecular characterization of the insert in event NK603 (Deng *et al.*, 1999) demonstrated that one complete copy of the DNA fragment used for transformation is present in the genome of corn event NK603. In addition to the one complete copy, a 217-bp segment containing a portion of the enhancer region of the rice actin promoter is inversely linked to the 3' end of the inserted transformation cassette in Roundup Ready event NK603 (Figure 1A). This portion of the enhancer region of the rice actin promoter is highly unlikely to act as a promoter (Deng *et al.*, 1999).

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B. Purpose.

The objective of this study was to further confirm the DNA sequences flanking the 5'and 3' ends of the insert in Roundup Ready corn event NK603.

III. MATERIALS AND METHODS

A. Test Substance. The test substance for this study was the Roundup Ready corn event NK603. DNA extracted in Study # 99-01-46-26 was used in this analysis.

B. Control Substance. The control substance was the non-transgenic corn line B73. DNA extracted in Study # 99-01-46-26 was used in this analysis.

A. Reference Substance. The reference substance was the 100 bp DNA Ladder (2.1 Kb-0.1 Kb) molecular size marker from Gibco BRL (Gaithersburg, MD).

D. Test System. There was no test system. Analytical methods were used in this study.

E. DNA Isolation. Corn leaf tissue (7.8-9.5 g) was ground to a fine powder using a pre-cooled mortar and pestle and transferred to a 35-ml centrifuge tube. Sixteen milliliters of CTAB extraction buffer [1.5% (w/w) CTAB, 75 mM Tris-HCl pH 8.0, 100 mM EDTA pH 8.0, 1.05 M NaCl, and 0.75% (w/w) PVP (MW 40,000)] was added to each tube; the tubes were then incubated at 60°C for 60 min and then allowed to cool at room temperature for 5-10 min. An equal volume (~16 ml) of chloroform:isoamyl alcohol (24:1) was added to each sample. The suspension was mixed by inversion of the tube several times and centrifuged for 10 min at approximately 8,800 x *g* at 20°C. The upper aqueous phase was transferred to a clean 35-ml centrifuge tube and re-extracted with chloroform:isoamyl alcohol. The upper aqueous phase was transferred to a new tube, approximately 10 ml of isopropanol was added to each tube, and the contents of each tube were mixed by inversion. The samples were kept in a -20°C freezer for at least 30 min. The samples were centrifuged at 14,000 x *g* for 20 min at 4°C to pellet the DNA, and the supernatant was discarded. The pellet was re-dissolved in 2 ml of TE [10mM Tris-HCl pH 8.0, 1 mM EDTA] and transferred to a 13-ml tube. Approximately 20 µl of 10 mg/ml DNase-free RNase was added to each sample and the tubes were incubated at 37°C for 30 min. Following the incubation, two milliliters of chloroform:isoamyl alcohol (24:1) was added to each sample. The suspension was mixed by inversion and centrifuged for 10 min at 8,000 x *g* at room temperature. The upper aqueous phase was transferred to a new tube and 1 ml of 7.5 M ammonium acetate was added to each tube and the contents were gently mixed. Approximately 2 volumes (5 ml) of 100% ethanol was added to each tube and the tubes were kept in a -20°C freezer for 2h to overnight. The DNA was pelleted by

centrifugation at 14,000 x *g* for 20 min at 4°C, the pellet was washed with 70% ethanol, vacuum dried for 10 min , re-dissolved in 0.5 ml TE, pH 8.0, and stored in a 4°C refrigerator.

F. DNA Quantitation. DNA quantitation was conducted using a Hoefer DyNA Quant 200 Fluorometer using Boehringer Mannheim (Indianapolis, IN) molecular size marker IX as a DNA calibration standard.

G. PCR Analyses of the Genomic Sequences Flanking the 5' and 3' Ends of the Insert in Corn Event NK603. PCR analysis of the genomic sequences flanking the 5' end of the insert in NK603 was performed using one primer derived from the 5' genomic flanking sequence paired with a second primer located in the rice actin promoter near the 5' end of the inserted DNA, covering a 498-bp region (Primers 1 and 2, Figure 1A). The PCR analysis for genomic sequences flanking the 3' end of the NK603 insert was conducted using one primer located in the NOS 3' polyadenylation sequence near the 3' end of the insert paired with a second primer derived from the 3' genomic flanking sequence spanning a 1183-bp region (Primers 3 and 4, Figure 1A). The PCR analyses were conducted using 50 ng of event NK603 genomic DNA or B73 non-transgenic genomic DNA template in a 50 µl reaction volume containing a final concentration of 1.5 mM Mg^{2+}, 0.4 µM of each primer, 200 µM each dNTP, and 2.5 units of *Taq* DNA polymerase. The reactions were performed under the following cycling conditions: 1 cycle at 94°C for 3 minutes; 38 cycles of 94°C for 30 seconds, 60°C for 30 seconds, 72°C for 1.5 minutes; 1 cycle at 72°C for 10 minutes. The PCR products were separated using 1.5 % agarose gel electrophoresis at 75 V for ~1 hour and visualized by ethidium bromide staining.

H. Isolation and Sequencing of the 5' and 3' PCR Products. PCR products of the expected sizes representing the 5' and 3' flanking sequences generated with numerous primer pairs were isolated by electrophoretic separation of 10-20 µl of the PCR products on 2.0% agarose gels. The PCR fragments representing the 5' and 3' flanking sequences were excised from the gel and purified using the QIAquick Gel Extraction Kit (Qiagen, catalog # 28704) following the procedure supplied by the manufacturer. The purified 5' PCR products were then sequenced with the initial 5' PCR primers. Due to the length of the 3' PCR products, sequencing was performed with both the initial 3' PCR primers as well as primers designed internal to the amplified sequence. All sequencing was performed by the Monsanto Genomics Sequencing Center using dye-terminator chemistry.

IV. RESULTS AND DISCUSSION

A. PCR Analyses of the DNA Sequences Flanking the 5' and 3' Ends of the Insert in Corn Event NK603. PCR analyses were performed on genomic DNA extracted from Roundup Ready corn event NK603 and non-transgenic corn line B73 to verify the DNA sequence flanking the 5' and 3' ends of the insert in corn event NK603. The positions of the PCR primers, as well as the results of the PCR analyses are presented in Figures 1A and 1B, respectively. The control reactions containing no template (Lanes 4 and 8) as well as the reactions containing B73 non-transgenic corn DNA (Lanes 2 and 6) did not generate a PCR product with either primer set, as expected. PCR on the Roundup Ready corn event NK603 DNA (Lanes 3 and 7) generated the expected size products of 498 bp representing the 5' flanking sequence and 1183 bp representing the 3' flanking sequence. These results demonstrate that a predicted size PCR product is generated from both ends of the insert in Roundup Ready corn event NK603.

how can it be predicted when >300 bp of chloroplast DNA is also present?

B. DNA Sequence Verification of the Genomic Sequences Flanking the 5' and 3' Ends of the Insert in Corn Event NK603. The consensus sequence of numerous PCR products representing the genomic sequence flanking the 5' end of the insert is presented in Figure 2A. Sequence data indicate that the amplicon depicted in Figure 1B consists of 308 bp of corn genomic DNA flanking the insert followed by 190 bp at the 5' end of the rice actin promoter. The consensus sequence of a number of PCR products representing the DNA flanking the 3' end of the insert is presented in Figure 2B. The amplicon in Figure 1B consists of 164 bp of the NOS 3' polyadenylation sequence which defines the 3' end of the insert, immediately followed by a 217-bp segment of DNA derived from the 5' end of the transformation cassette positioned in the inverse orientation. This 217-bp segment includes plasmid PV-ZMGT32 polylinker sequence (50 bp) and the first 167 bp of the enhancer region of the rice actin promoter, position -835 to -669 from the start of transcription as defined by McElroy *et al.* (1990). This 217-bp segment is followed by 305 bp of DNA with homology to chloroplast DNA. Immediately adjacent to this DNA is 497 bp of corn genomic DNA. These data delineate the 5' and 3' ends of the insert in NK603 and show the DNA which immediately flanks the insert on both ends.

V. CONCLUSIONS

Previous molecular analyses of Roundup Ready corn event NK603 (Deng *et al.*,1999) demonstrated that there is one complete copy of the DNA fragment used for transformation in event NK603, along with a 217-bp segment containing a portion of the enhancer region of the rice actin promoter inversely linked to the 3' end of the inserted transformation cassette. As part of this study, PCR and sequence analyses were performed which confirmed the 5' and 3' ends of the insert in corn event NK603, and verified the genomic sequence flanking the 5' end (308 bp) and 3' end (497 bp) of the insert.

VI. REFERENCES

Deng, M.Y., Lirette, R.P., Cavato, T.A., and Sidhu, R.S. 1999. Molecular Characterization of Roundup Ready® (CP4 EPSPS) Corn Line NK603. MSL-16214, an unpublished study by Monsanto.

McElroy, D., Zhang, W., Cao, J., and Wu, R. 1990. Isolation of an efficient actin promoter for use in rice transformation. Plant Cell. 2, 163-171.

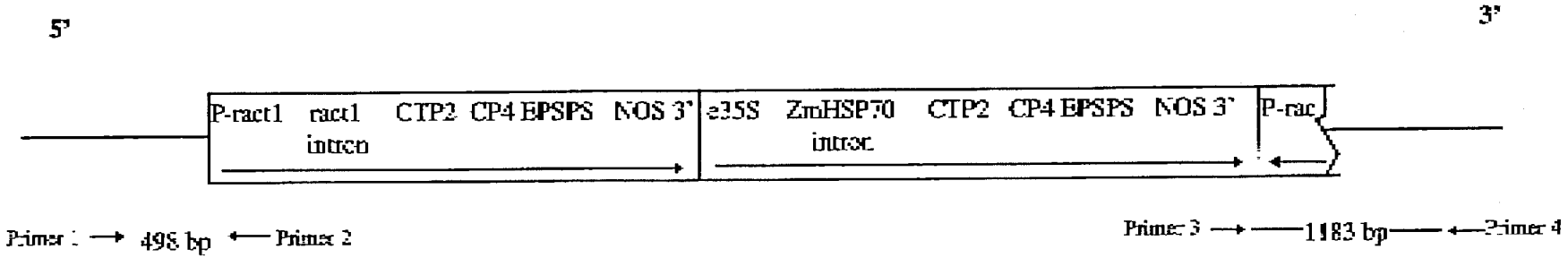

Figure 1A. Schematic Representation of the Insert in Roundup Ready Corn Event NK603. This figure depicts the predicted insert for event NK603 as presented in Deng *et al.* (1999). There is one complete copy of the DNA fragment used for transformation containing two CP4 EPSPS cassettes. Immediately 3' of the second CP4 EPSPS cassette there is a 217-bp segment of the transformation cassette containing a portion of the enhancer region of the rice actin promoter positioned in the inverse orientation. The primers used for the PCR analyses are illustrated. Primer 1 sits in the 5' flanking sequence of NK603 while Primer 2 sits in the rice actin promoter, and Primer 3 sits in the NOS 3' polyadenylation sequence while Primer 4 sits in the 3' flanking sequence of NK603.

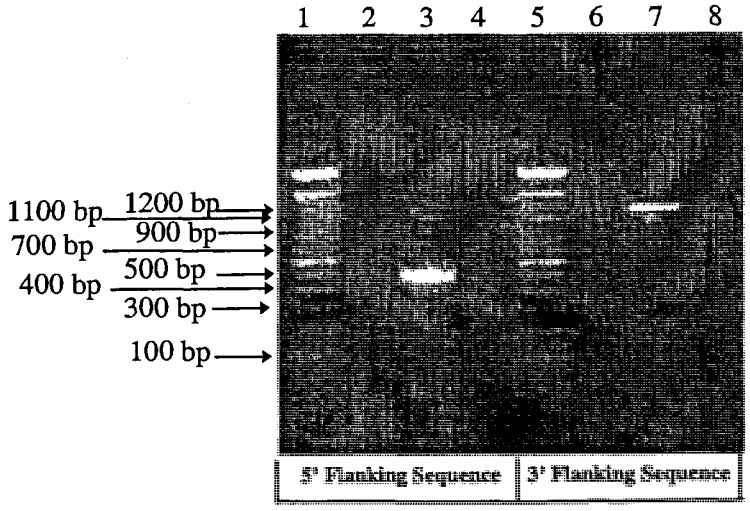

Figure 1B. PCR Analyses of the 5' and 3' Flanking Genomic DNA Sequences in Corn Event NK603. PCR analyses were performed using Primers 1 and 2 to confirm the 5' flanking sequence and Primers 3 and 4 to confirm the 3' flanking sequence on DNA extracted from leaf tissue of event NK603 (Lanes 3 and 7) and B73 non-transgenic DNA (Lanes 2 and 6). Lanes 1 and 5 contain Gibco BRL 100 bp DNA Ladder for use as a size indicator and Lanes 4 and 8 were no template control PCR reactions. Approximately 10 µl of each PCR reaction were loaded on a 2.0% agarose gel stained with ethidium bromide.

⟶ Symbol denotes sizes obtained from the Gibco BRL 100bp DNA Ladder.

[CBI CROSS REFERENCE 1]

[CBI CROSS REFERENCE 2]

Appendix 1

Study Protocol

Monsanto Study #: **00-01-46-30**

Study Title: Confirmation of the genomic DNA sequences flanking the 5' and 3' ends of the insert in Roundup Ready® Corn Line NK603.

Sponsor:
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700 Chesterfield Parkway North
St. Louis, MO 63198

Primary Testing Facility:
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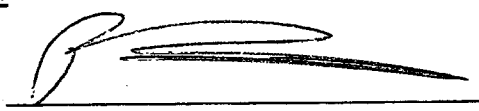
[redacted]

Approved By:



Aug 8, 2000
Date

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Linda K. Lahman

August 8, 2000
Date

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Tracey A. Cavato

August 8, 2000
Date

Tracey A. Cavato
Study Director
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Reviewed By:

Joan M. Rojda-Heath

August 8, 2000
Date

Quality Assurance Specialist
Monsanto Company
Monsanto Regulatory

[redacted]

[redacted]

1.0 Regulatory Compliance

1.1 GLP Compliance

This is a product characterization study as defined by section §160.135(b) of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Good Laboratory Practice Standards (40 CFR Part 160) intended to characterize the physical and/or chemical properties of a potential commercial product. This study will be conducted in compliance with all requirements of section §160.135(b), except for the Monsanto Genomics Sequencing Center, a non-GLP facility.

2.0 Purpose

The purpose of this study is to confirm the genomic DNA sequence flanking the 5' and 3' ends of the insert in Roundup Ready corn line NK603.

3.0 Timelines

3.1	Proposed Experimental Start Date:	August 14, 2000
3.2	Proposed Experimental Termination Date:	August 30, 2000

4.0 Test, Control and Reference Substances

4.1 Test Substance

The test substance is the Roundup Ready corn line NK603.

4.2 Control Substance

The control substance is the non-transgenic corn line B73.

4.3 Reference Substance

The reference substance will be the molecular size markers from Gibco BRL (100 bp ladder).

4.4 Characterization of Test, Control and Reference Substances

The identity of the test and control substances was confirmed and is archived in the Monsanto Regulatory archives under Study # 99-01-46-26.

5.0 Description of Experimental Design

Genomic DNA from the test substance will be subjected to PCR for the amplification of the DNA sequences containing the 5' and 3' ends of the insert, the insert-to-plant junctions, as well as portions of the plant DNA flanking the

[redacted]

insert. The amplicons produced will be purified and sequenced by the Monsanto Genomics Sequencing Center (a non-GLP facility).

5.1 Analytical Methods

All methods will be conducted as described below or by other appropriate methods approved by the Study Director and documented in the raw data.

5.1.1 DNA Extraction

The DNA from both the test and control substances was previously isolated from leaf tissue under Study # 99-01-46-26. The raw data, or copy of the raw data, detailing the extraction will be archived with this study. All previously extracted DNAs have been stored at 2-8°C. If necessary, additional DNA will be extracted under this protocol using methods approved by the study director.

5.1.2 DNA Quantitation

Any needed DNA quantitation will be conducted using Hoefer's DyNA Quant 200 Fluorometer according to SOP # BR-EQ-0065-01.

5.1.3 Polymerase Chain Reaction

PCR amplification will be performed using genomic DNA template from both the test and control substances following standard PCR methodologies which will be documented in the raw data associated with this study. The 5' end will be amplified using one primer designed to the 5' genomic flanking sequence paired with a second primer located in the insert. The 3' sequence will be amplified using a primer designed to the 3' genomic flanking sequence with a second primer located in the insert.

5.1.4 Agarose Gel Electrophoresis

PCR products will be separated on an agarose gel according to SOP # GEN-PRO-003-01. After electrophoresis, the DNA from the test substance amplifications will be purified from the agarose matrix using an extraction kit following the procedure supplied by the manufacturer.

5.1.5 Sequencing of Purified Products

Purified PCR products will be mixed with appropriate primers and submitted to the Monsanto Genomics Sequencing Center for sequencing.

6.0 Control of Bias

A PCR containing no template DNA will be prepared with each primer set to serve as a negative control. In addition, the control substance DNA will serve as a negative control for PCR.

[redacted]

7.0 Records to be Maintained

Records will be maintained of all sample transfers, analyses, the protocol and all deviations and amendments thereto and copies of all letters, memoranda and other correspondence related to this study. These documents may include: photocopies, computer generated hard copies or hand-written notes that describe the procedures used to generate data for this study. Upon completion of the study, all study records and final report will be archived in the Monsanto Regulatory archives.

8.0 Changes to the Protocol

Planned changes to the protocol will be documented in the form of written protocol amendments and signed by the Study Director. Amendments become part of the protocol and will be archived with the protocol. All other changes will be in the form of written protocol deviations and will be filed with the raw data. All changes to the protocol will be addressed in the final report.

[redacted]

Study Title

Compositional Analyses of Forage and Grain Collected From Roundup Ready® Maize Event NK603 Grown in 1999 E.U. Field Trials

Authors

William P. Ridley
Cherian George
Margaret A. Nemeth
James D. Astwood
Matthew L. Breeze*
Roy Sorbet**

Study Completed on

November 17, 2000

Performing Laboratories

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Laboratory Project ID

MSL-16897
Monsanto Study No. 99-01-46-52
Covance Study No. 6103-252

[redacted]

[redacted]

Company: Monsanto Company

Company Agent: _____

Title: _____

Signature: _____ Date: _____

Statement of Compliance

This study meets GLP requirements of 40 CFR Part 160 (EPA) except for the following:

The reference standards used for compositional analysis were not characterized according to GLP standards and reserve samples from each batch of the reference standards were not retained. These exceptions had no effect on the integrity or quality of the study because the reference standards were obtained from reputable suppliers and were accompanied by Certificates of Analysis.

Sponsor Representative: Linda K. Lahman Date: 11/17/00

Study Director: William P. Ridley Date: Nov. 17, 2000

Quality Assurance Statement

Study Title: Compositional Analyses of Forage and Grain Collected From Roundup Ready® Maize Event NK603 Grown in 1999 E.U. Field Trials

Study Number: 99-01-46-52

Reviews conducted by the Quality Assurance Unit confirm that the final report reflects the raw data.

The following is a list of the reviews conducted by Monsanto Regulatory Quality Assurance Unit on the study reported herein. Additional reviews conducted by the Quality Assurance Unit of Covance Laboratories are specified in the contract facility subreport which was included as Appendix 2.

Dates Of Inspection / Audit	Phase	Date Reported To: Study Director	Management
10/30/00	Raw Data/Draft Report	10/30/00	10/30/00
11/16/00	Final Review	11/16/00	11/16/00

Paula A. Price

Quality Assurance Unit
Monsanto Regulatory, Monsanto Company

Nov. 17, 2000
Date

Signatures of Approval

Study Number: 99-01-46-52

Title: Compositional Analyses of Forage and Grain Collected From Roundup Ready® Maize Event NK603 Grown in 1999 E.U. Field Trials

Facilities:

Monsanto Company
Biotechnology Regulatory Sciences
700 Chesterfield Parkway North
St. Louis, Missouri 63198, USA

Covance Laboratories, Inc.
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Madison, WI 53704, USA

Certus International, Inc.
16052 Swingley Ridge Rd., Suite 110
Chesterfield, MO 63017, USA

Study Director: William P. Ridley
Sponsor Representative: Linda K. Lahman

Contributors: Monsanto (St. Louis): Margaret A. Nemeth and Susan Riordan
Covance Labs., Inc (Madison): Matthew L. Breeze (composition analysis)
Certus International, Inc (St. Louis): Roy Sorbet (statistical analysis)

Study Initiation Date: April 13, 2000
Study Completion Date: November 17, 2000

Records Retention: All study specific raw data, protocols, final reports and facility records will be retained at Monsanto, St. Louis except for raw data and facility records maintained at Covance Laboratories, Inc., Wisconsin Facility.

Sample Storage: Any unused study samples that are not destroyed will be stored at Monsanto, St. Louis.

Signatures of Approval

William P. Ridley — Nov 17, 2000
Study Director — Date

Director Product Safety Center — Nov. 17, 2000
Date

Linda K. Lahman — 11-17-00
Sponsor Representative — Date

Table of Contents

Tables

Appendices

Abbreviations

ADF	Acid detergent fiber
AA	Amino acid
AACC	American Association of Cereal Chemists
AOAC	Association of Official Analytical Chemists
AOCS	American Oil Chemists Society
CP4 EPSPS	5-Enolpyruvylshikimate-3-phosphate synthase protein isolated from *Agrobacterium* sp. strain CP4
DW or dw	Dry weight
FA	Fatty acid
FW or fw	Fresh weight
na	Not available
NDF or NDFE	Neutral detergent fiber
ppm	parts per million (µg of analyte/g of sample)
RR	Roundup Ready®
Site FN-1	Field trial site in Germignonville, France
Site FN-2	Field trial site in Janville, France
Site FS-3	Field trial site in L'Isle Jourdain, France
Site IT-4	Field trial site in Bagnarola, Italy
SOP	Standard Operating Procedure
T/C	Test/Control
TIU	Trypsin inhibitor units

[Standard abbreviations, e.g., units of measure, according to format described in 'Instructions to Authors' in the Journal of Biological Chemistry]

1.0 Summary

Monsanto Company has developed Roundup Ready® maize line NK603 which is tolerant to glyphosate (the active ingredient in Roundup® herbicide) at commercial levels of application. Maize line NK603 contains a 5-enolpyruvylshikimate-3-phosphate synthase protein from *Agrobacterium* sp. strain CP4 (CP4 EPSPS). Maize plants that demonstrate commercial level tolerance to Roundup herbicide are called Roundup Ready® (RR). The CP4 EPSPS gene from *Agrobacterium* sp. strain CP4 has been completely sequenced and encodes a 47.6-kDa protein consisting of a single polypeptide of 455 amino acids (Padgette *et al.*, 1995, Padgette *et al.*, 1996). The CP4 EPSPS protein is functionally similar to plant EPSPS enzymes but has a much reduced affinity for glyphosate (Padgette *et al.*, 1993, Padgette *et al.*, 1995). In non-transgenic plants, glyphosate binds to the plant EPSPS enzyme and blocks the biosynthesis of aromatic amino acids thereby depriving plants of these essential nutrients (Steinrucken and Amrhein, 1980; Haslam, 1993). In maize event NK603, nutritional requirements for normal growth and development are met by the continued action of the glyphosate-tolerant CP4 EPSPS enzyme in the presence of glyphosate. A comprehensive safety assessment of the CP4 EPSPS protein has been described in the literature (Harrison *et al.* 1996, Padgette *et al.*, 1996). A detailed molecular characterization of the NK603 event is contained in studies by Deng *et. al.* 1999.

The purpose of this study was to conduct compositional analyses on key maize tissues collected from the RR transgenic event NK603 (LH82xNK603+/B73BC2S2), the non-transgenic parental control line (LH82xB73BC2S2) and 19 commercial maize hybrids grown under field conditions. Field trials were conducted in the E.U. in 1999 at four replicated sites located in Germignonville, France (Site FN-1); Janville, France (Site FN-2); L'Isle Jourdain, France (Site FS-3); and Bagnarola, Italy (Site IT-4). Maize event NK603 and its control line were planted at all sites. A randomized complete block design was used for Sites FS-3 and IT-4. For Sites FN-1 and FN-2 the NK603 plots were not in the same block as the non-transgenic control plots due to space limitations and therefore an incomplete (treated/untreated) block design was used for these two sites. Forage and grain were collected from all sites. Compositional analyses were conducted to measure proximates (protein, fat, ash, moisture), acid detergent fiber (ADF), neutral detergent fiber (NDF), amino acids, fatty acids, vitamin E, minerals (calcium, copper, iron, magnesium, manganese, phosphorus, potassium, sodium and zinc), phytic acid and trypsin inhibitor content of grain; and to measure proximate, ADF and NDF content of forage. In addition, the content of carbohydrates in forage and grain was determined by calculation. In all, 51 different components (7 in forage and 44 in grain) were evaluated as part of the safety and nutritional assessment of maize event NK603.

Statistical analyses of the compositional data were conducted using a randomized complete block model analysis of variance for three sets of comparisons: analyses of data from replicated trials at Sites FS-3 and IT-4 and data from a combination of both trials. As there

were 51 components evaluated, a total of 153 comparisons were made: 51 comparisons for each of the three statistical analyses. The test event, NK603, was compared to the non-transgenic control line to determine statistically significant differences at $p<0.05$. In addition, the comparison of NK603 to the 95% tolerance interval for the commercial reference varieties was conducted to determine if the range of values for NK603 fell within the population of commercial maize. Since a randomized complete block design was not possible for replicated trials at Sites FN-1 and FN-2, descriptive statistics including means, standard errors (S.E.) and the range of values were determined for these trials.

The results of compositional analyses showed that the 51 components measured in maize event NK603 were either within the range observed for commercial maize lines planted at the same E.U. sites in 1999, were within published literature ranges (Jugenheimer, 1976; Watson, 1982; Watson, 1987), or were within historical ranges for non-transgenic maize varieties (Sanders and Patzer, 1995; Sanders *et al.*, 1996a,b; 1997a,b,c). There were no statistically significant differences in 126 of the 153 comparisons made between maize event NK603 and the non-transgenic control line which included the levels of forage components (moisture, fat, protein, ash, carbohydrate, ADF and NDF) and grain components (ash, moisture, ADF, NDF, seven of 18 amino acids, two of eight fatty acids, five of eight minerals, vitamin E and trypsin inhibitor). The means and standard errors for sites FN-1 and FN-2 with an incomplete (treated/untreated) block design were consistent with that obtained for sites FS-3 and IT-4.

Of the 27 comparisons found to be statistically different, 5% or approximately eight (0.05×153), were expected to be false positives based on chance alone. Differences that were observed for only one or two of these comparisons, and not consistently across all three comparisons, are unlikely to be of biological significance. The differences between the test event and the control line expressed as a percent of the control values ranged between 1.13%-22.93%. Furthermore, the range of values for those compositional components associated with the small statistical differences were found to all fall within the 95% tolerance interval for commercial varieties planted at the same E.U. sites in 1999. This demonstrates, with a confidence level of 95%, that the levels of key nutrients and other biochemical components for NK603 were within the same population as expected for non-transgenic commercial reference maize used in this study. Therefore, these minor differences are unlikely to be biologically meaningful, and the grain and forage from NK603 is considered compositionally equivalent to that of conventional maize grain and forage.

These data support the conclusion that the Roundup Ready® maize event NK603 is compositionally equivalent and as safe and nutritious as the maize varieties grown commercially today.

2.0 Introduction

2.1 Background

Monsanto Company has developed Roundup Ready® maize line NK603 which is tolerant to glyphosate (the active ingredient in Roundup® herbicide) at commercial levels of application. Maize line NK603 contains a 5-enolpyruvylshikimate-3-phosphate synthase protein from *Agrobacterium* sp. strain CP4 (CP4 EPSPS). Maize plants that demonstrate commercial level tolerance to Roundup herbicide are called Roundup Ready® (RR). The CP4 EPSPS gene from *Agrobacterium* sp. strain CP4 has been completely sequenced and encodes a 47.6-kDa protein consisting of a single polypeptide of 455 amino acids (Padgette *et al.*, 1995, Padgette *et al.*, 1996). The CP4 EPSPS protein is functionally similar to plant EPSPS enzymes but has a much reduced affinity for glyphosate (Padgette *et al.*, 1993, Padgette *et al.*, 1995). In non-transgenic plants, glyphosate binds to the plant EPSPS enzyme and blocks the biosynthesis of aromatic amino acids thereby depriving plants of these essential nutrients (Steinrucken and Amrhein, 1980; Haslam, 1993). In maize event NK603, nutritional requirements for normal growth and development are met by the continued action of the glyphosate-tolerant CP4 EPSPS enzyme in the presence of glyphosate. A comprehensive safety assessment of the CP4 EPSPS protein has been described in the literature (Harrison *et al.* 1996, Padgette *et al.*, 1996). A detailed molecular characterization of the NK603 event is contained in studies by Deng *et. al.* 1999.

2.2 Purpose

The purpose of this study was to conduct compositional analyses on key maize tissues collected from the RR transgenic line NK603 (LH82xNK603+/B73BC2S2), the non-transgenic parental control line (LH82xB73BC2S2), and 19 different commercial maize hybrids grown under field conditions. Field trials were conducted in the E.U. in 1999 at four replicated sites located in Germignonville, France (Site FN-1); Janville, France (Site FN-2); L'Isle Jourdain, France (Site FS-3); and Bagnarola, Italy (Site IT-4). Maize event NK603 and its control line were planted at all sites. A randomized complete block design was used for Sites FS-3 and IT-4. Due to space limitations the NK603 plots were not in the same block as the non-transgenic control plots for Sites FN-1 and FN-2 and therefore a incomplete block design was used for these two sites. Forage and grain were collected from all sites. Compositional analyses were conducted to measure proximates (protein, fat, ash, moisture), acid detergent fiber (ADF), neutral detergent fiber (NDF), amino acids, fatty acids, vitamin E, minerals (calcium, copper, iron, magnesium, manganese, phosphorus, potassium, sodium and zinc), phytic acid and trypsin inhibitor content of grain; and to measure proximates, ADF and NDF content of forage. In addition, the content of carbohydrates in forage and grain was determined by calculation. Statistical evaluation included comparisons of the composition data for NK603 to the control line to determine statistically significant differences at $p < 0.05$. Also the statistical evaluation included comparisons of NK603 to the 95% tolerance interval

for the commercial reference varieties to determine if the range of values for NK603 fell within the population of commercial maize hybrids.

3.0 Materials and Methods

3.1 Test Substance

The test substance was maize event NK603, hybrid LH82xNK603+/B73BC2S2, grown in 1999 E.U. field trials (Study Plan 99-RR-01-F/It). The test substance contained the gene encoding the CP4 EPSPS protein.

3.2 Control Substance

The control substance was the non-transgenic parental line (hybrid LH82 x B73BC2S2) grown in 1999 E.U. field trials (Study Plan 99-RR-01-F/It). The control line has a genetic background similar to that of the test event but lacks the gene encoding CP4 EPSPS protein.

3.3 Reference Substances

There were 19 different non-transgenic commercial maize lines used as reference substances for this study. The reference code number, site number, commercial name and producer of the seeds are included in the table below:

Reference Code #	Site Number	Commercial Name	Producer of Seeds
Reference 1	Site FN-1	Anjou 285	Angevin
Reference 2	Site FN-1	Banguy	Nickerson
Reference 3	Site FN-1	Chantal	Asgrow
Reference 4	Site FN-1	Oural	Asgrow
Reference 5	Site FN-1	Rival	Asgrow
Reference 1	Site FN-2	Banguy	Nickerson
Reference 2	Site FN-2	DK312	RAGT, France
Reference 3	Site FN-2	Liberal	Asgrow
Reference 4	Site FN-2	Radial	Asgrow
Reference 5	Site FN-2	Total	Asgrow
Reference 1	Site FS-3	Alvina	Pioneer FM
Reference 2	Site FS-3	Cecilia	Pioneer FM
Reference 3	Site FS-3	DK 300	RAGT, France
Reference 4	Site FS-3	Cherif	Verneuil semences
Reference 5	Site FS-3	Capitol	Maisadour
Reference 1	Site IT-4	Aramis	Dekalb
Reference 2	Site IT-4	Kelada	Pioneer
Reference 3	Site IT-4	Tevere	Asgrow
Reference 4	Site IT-4	Santos	Dekalb
Reference 5	Site IT-4	Balka	Pioneer

Appropriate standards were used in each assay as reference standards for the analytical procedures. The analytical standards used for compositional analyses are described in Section 3.7

3.4 Characterization of the Test and Control Substances

The identity of each test and control substance was verified by the Study Director prior to its use in the study by reviewing the chain-of-custody documentation supplied with the samples collected from the field. The test and control substances were characterized at the molecular level by extracting DNA from grain tissue and analyzing the DNA by event specific polymerase chain reaction (PCR).

3.5 Field Trials

The test and control substances were produced in 1999 E.U. field trials at four replicated sites (Study Plan 99-RR-01-F/It). A detailed description of the results of the field trials is contained in the field report (Vanbellinghen, 2000). A brief summary of the conduct and results of these trials is included for reference.

The four replicated trials were conducted at the following sites (site code): Germignonville, France (FN-1); Janville, France (FN-2); L'Isle Jourdain, France (FS-3); and Bagnarola, Italy (IT-4). These sites provided a variety of environmental conditions representative of regions in the E.U. where maize lines would be grown as commercial products. At Sites FS-3 and IT-4, test events, control lines and reference hybrids were planted in a randomized complete block design with four replications. At sites FN-1 and FN-2 space limitations prohibited the planting of NK603 plots in the same block as the non-transgenic control plots and as a result an incomplete block design was used at these two sites. Five different commercial reference hybrids were planted at each site. One commercial reference line was planted at two sites to give a total of nineteen different reference hybrids for the study. Each row was clearly marked with its unique MON number or REF number and plot number for line identification. All plants of the test events, control lines and reference hybrids were manually self-pollinated. Only the NK603 plots were treated with MON 52276 herbicide containing 360 gm/liter glyphosate acid equivalent with a single broadcast spray application at a rate of 3 liters/hectare when a majority of the maize plants were at the 4-6 leaf stage. Precautions were taken to minimize spray drift during the application to avoid contamination of the untreated plots.

Forage and grain were collected from all sites. Forage was collected from four to six whole plants (all above ground parts) at the soft dough stage from each of the replications of test events, control lines and reference hybrids. The plants were cut into 10 to 30 cm segments, combined in uniquely labeled bags and frozen on dry ice. Ears were hand-harvested from all self-pollinated test, control and reference plants at normal kernel maturity, dried to a moisture level of approximately 10-15%, shelled, and the kernels pooled to provide grain samples. Forage (on dry ice) and grain (at ambient temperature) samples were shipped to Monsanto

facility at Louvain-la-Neuve, Belgium. Forage was stored frozen at Louvain-la-Neuve, homogenized with dry ice and sent to Sponsor's facility in St. Louis. Grain was stored at ambient temperature at Louvain-la-Neuve prior to shipment to St. Louis. Compositional analyses were conducted on forage and grain in this study as described in Section 3.7.

3.6 Test System

There was no test system for this study. Analytical methods were used to evaluate the test event, control line and reference lines. Compositional analyses were performed by modifications of published methods that are currently used to evaluate the nutritional quality of maize (see Section 3.7).

3.7 Compositional Analytical Methods

Forage and grain samples for each replicate of the test events, control lines and commercial reference lines for an individual site were shipped to Covance Laboratories, Inc., Madison, Wisconsin for compositional analyses. Grain samples were analyzed for proximates (protein, fat, ash, moisture), ADF, NDF, amino acids, fatty acids, vitamin E, minerals (calcium, copper, iron, magnesium, manganese, phosphorus, potassium, sodium and zinc), phytic acid and trypsin inhibitor. Forage samples were analyzed for proximates, ADF and NDF. Carbohydrate levels in forage and grain were determined by calculation. The same methods were used for the proximate analysis of forage and grain except for the analysis of fat as described below. The analytical data generated by Covance Laboratories, Inc. was summarized in an Analytical Subreport (Covance study number 6103-252) that was attached as Appendix 2.

Acid detergent fiber (ADF). The method used was based on a modified version of a USDA method (1970). The sample was placed in a fritted vessel and washed with an acidic boiling detergent solution that dissolved the protein, carbohydrate, and ash. An acetone wash was used to remove the fats and pigments. The lignocellulose fraction was collected on the frit and determined gravimetrically. The limit of detection of the method (LOD) for this study was 0.1% fresh weight (fw).[1] There was no analytical reference substance for this analysis.

Amino acid composition (TAAP). The method used was based on a modified version of AOAC method 982.30 (2000) that estimates the levels of 18 amino acids in the sample: alanine, arginine, aspartic acid (including asparagine), cystine (including cysteine), glutamic acid (including glutamine), glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine and valine. The sample was assayed by three methods to obtain the full profile. Tryptophan required a base hydrolysis using sodium hydroxide. Sulfur containing amino acids required an oxidation using performic acid prior to hydrolysis with hydrochloric acid. Analysis of the remaining amino acids was

[1] % fw = (g/g fw) x 100

accomplished through direct hydrolysis with hydrochloric acid. The individual amino acids were quantitated using an automated amino acid analyzer. The LOD of the method for this study was 0.1 mg/g fw. The reference standards were: Beckman K18, 2.5 µmol/mL per constituent except cystine (1.25 µmol/mL), lot no. S901670 and S911165; Aldrich L-tryptophan, 99%, lot no. 12729HS; Aldrich L-cysteic acid monohydrate, 98.0%, lot no. 04615MS; and Sigma L-methionine sulfone, 100%, lot no. 12H3349.

Ash (ASHM). The method used was based on a modified version of AOAC method 923.03 (2000). The sample was placed in an electric furnace at 550 °C and ignited to drive off volatile organic compounds. The non-volatile matter remaining was quantitated gravimetrically and the percent ash was determined by calculation. The LOD of the method for this study was 0.1% fw. There was no analytical reference substance for this analysis.

Carbohydrates (CHO). The method used was based on a USDA method (1973). The limit of detection for this study was 1.0% and there was no reference standard. Carbohydrate values were calculated by difference using the fresh weight-derived data and the following equation:

$$\% \text{ carbohydrates} = 100\% - (\% \text{ protein} + \% \text{ fat} + \% \text{ ash} + \% \text{ moisture})$$

Fat by acid hydrolysis (FAAH). The method used was based on modified versions of AOAC methods 922.06 and 954.02 (2000). The forage sample was hydrolyzed with hydrochloric acid at an elevated temperature. The fat was extracted using diethyl ether followed by hexane. Extracts were washed with a dilute alkali solution and filtered through a sodium sulfate column. The extract was evaporated, dried and weighed. The limit of detection of this method for this study was 0.1% fw. There was no analytical reference substance for this analysis.

Fat by soxhlet extraction (FSOX). The method used was based on a modified version of AOAC method 960.39 (2000). The grain sample was weighed into a cellulose thimble containing sand or sodium sulfate and dried to remove excess moisture. Pentane was dripped through the sample to remove the fat. The extract was evaporated, dried and weighed. This method was used for grain sample analysis. The limit of detection of the method for this study was 0.1% fw. There was no analytical reference substance for this analysis.

Fatty acids (FAPM). The method used was based on a modified version of AOCS method Ce 1-62 (1997) that estimates the levels of 22 fatty acids in the sample: 8:0 caprylic acid, 10:0 capric acid, 12:0 lauric acid, 14:0 myristic acid, 14:1 myristoleic acid, 15:0 pentadecanoic acid, 15:1 pentadecenoic acid, 16:0 palmitic acid, 16:1 palmitoleic acid, 17:0 heptadecanoic acid, 17:1 heptadecenoic acid, 18:0 stearic acid, 18:1 oleic acid, 18:2 linoleic acid, 18:3 linolenic, 18:3 gamma linolenic acid, 20:0 arachidic acid, 20:1 eicosenoic acid, 20:2 eicosadienoic acid, 20:3 eicosatrienoic acid, 20:4 arachidonic acid and 22:0 behenic acid.

Lipid in grain samples was extracted and saponified with 0.5 N sodium hydroxide in methanol. The saponification mixture was methylated with 14% (weight/volume) boron trifluoride:methanol. The resulting methyl esters were extracted with heptane containing an internal standard. The methyl esters of the fatty acids were analyzed by gas chromatography using external standards for quantitation. The limit of detection of this method for this study was 0.004%. The analytical reference standards (purity used as 100%) were: Nu Chek Prep Hazelton special prep nos. 1 (lot no. A4-k), 2 (lot no. S10-G), 3 (lot no. F23-J), 4 (lot no. JY26-J); and Nu Chek Prep methyl gamma linolenate (lot no. U-63M-F25-J).

Minerals/ICP emission spectrometry (ICPS). The method used was based on modified version of AOAC methods 984.27 and 985.01 (2000) and a literature method (Dahlquist *et al.*, 1978). This method was used to estimate the levels of nine minerals in the sample: calcium, copper, iron, magnesium, manganese, phosphorous, potassium, sodium and zinc. Samples were dried, precharred and ashed overnight at 500° ± 50°C. Ashed samples were treated with hydrochloric acid, taken to dryness and dissolved in 5% (v/v) hydrochloric acid. The amount of each element was determined at appropriate wavelengths by comparing the emission of the unknown sample, using inductively coupled plasma, with the emission of the standard solutions described below.

Mineral	Lot Number	Concentration (ppm)	Limit of Detection (ppm)
Calcium	L6-59CA	10,000	20.0
Copper	6-242CU	1,000	0.500
Iron	7-97FE	1,000	2.00
Magnesium	L5-187MG	10,000	20.0
Manganese	6-201MN	1,000	0.300
Phosphorus	K6-54P	10,000	20.0
Potassium	M6-16K	10,000	100
Sodium	M6-41NA	10,000	100
Zinc	6-264ZN	1,000	0.400

Moisture (M100). The method used was based on a modified version of AOAC methods 926.08 and 925.09 (2000). Samples were dried in a vacuum oven at 100°C to a constant weight. The moisture loss was determined and converted to percent moisture. The limit of detection of this method for this study was 0.1% fw. There was no analytical reference substance for this analysis.

Neutral detergent fiber, enzyme method (NDFE). The method used was based on modified versions of an AACC method 32.20 (1998) and a USDA method (1970). Samples were placed in a fritted vessel and washed with a neutral boiling detergent solution to dissolve the

protein, carbohydrate, enzyme and ash. Fats and pigments were removed using an acetone wash. The hemicellulose, cellulose and lignin fractions were collected on a frit and determined gravimetrically. The limit of detection of this method for this study was 0.1% fw. There was no analytical reference substance for this analysis.

Phytic acid (PHYT). The method used was based on modifications of two literature methods (Lehrfeld 1989, 1994). Samples were extracted using ultrasonication. Purification and concentration was performed using a silica based anion exchange (SAX) column. Sample analysis was conducted using a macroporous polymer high-performance liquid (HPLC) column [PRP-1, 5µm (150 x 4.1 mm)] connected to a refractive index detector. The limit of quantitation for this study was approximately 0.05 to 0.08% fw. The reference substance for this assay was Aldrich phytic acid, dodecasodium salt hydrate, 99%, lot no. 13529MS.

Protein (PGEN). The method used was based on modifications of AOAC methods 955.04 and 979.09 (2000) and literature methods (Bradstreet, 1965; Kalthoff and Sandell, 1948). Protein and other nitrogenous compounds in the sample were reduced to ammonia by digestion of the sample with sulfuric acid containing a mercury catalyst mixture. The acid digest was made alkaline, and the ammonia was distilled and titrated with a standard acid. The percent nitrogen was determined and converted to percent protein by multiplication with 6.25. The limit of detection of this method for this study was 0.1% fw. There was no analytical reference substance for this analysis.

Trypsin inhibitor (TRIP). The method used was based on a modified version of a AOCS method Ba 12-75 (1997). Trypsin inhibitor activity in the sample was determined by suspending the ground, defatted sample in dilute sodium hydroxide solution. An appropriate dilution of the suspension was made, and a series of aliquots resulting in increased levels of the diluted suspension was mixed with trypsin and benzoyl-DL-arginine-p-nitroanilide. After 10 minutes, the action of the trypsin was stopped by the addition of acetic acid. The diluted suspension mixture was filtered or centrifuged and the absorbance of each filtered solution was measured at 410 nm. Trypsin inhibitor activity was calculated from the change in absorbance values due to the aliquot volume. The limit of detection for this study was 1.0 Trypsin Inhibitor Unit (TIU)/mg fw.

Vitamin E (EFD2). The method used was based on a modification of a literature method (Cort *et al.*, 1983). Samples were saponified to break down fat and release vitamin E. The saponified mixture was extracted with ethyl ether and quantitated directly by HPLC on a silica column. The limit of quantitation for this study was approximately 0.005 mg/g fw. The reference substance for this assay was United States Pharmacopeia (USP) alpha tocopherol, 100%, lot number M.

3.8 Control of Bias

The test and control lines were treated identically at each site. Corn forage and grain tissues were ground thoroughly before use to minimize tissue bias. The samples were analyzed by site and the order of samples was randomized to minimize assay bias.

3.9 Data Reduction and Statistical Analysis

Composition data from Covance, Inc., containing individual values for each analysis, were checked for accuracy at Monsanto Company and then transferred to Certus International for statistical analysis. The statistical results were summarized by Certus International in a subreport that was attached as Appendix 3. The following fifteen analytes with >85% of observations at or below the LOD of the assay were excluded from statistical analysis: sodium, 8:0 caprylic acid, 10:0 capric acid, 12:0 lauric acid, 14:0 myristic acid, 14:1 myristoleic acid, 15:0 pentadecanoic acid, 15:1 pentadecenoic acid, 16:1 palmitoleic acid, 17:0 heptadecanoic acid, 17:1 heptadecenoic acid, 18:3 gamma linolenic acid, 20:2 eicosadienoic acid, 20:3 eicosatrienoic acid and 20:4 arachidonic acid. For 22:0 behenic acid there were 3 observations (3% of the total) below the LOD and for trypsin inhibitor there were 28 observations (26% of the total) below the LOD for these assays. To include a complete data set for these two analytes in the statistical analysis, values equal to half the detection limit were assigned for the missing 31 data points.

Except for moisture, all component values were converted from a fresh weight to a dry weight basis and into their respective units described in Tables 2-11 using the following expression: % dry weight = % fresh weight/d* where d* (fraction of dry matter) = [1 - (%moisture/100)]. Statistical analyses were conducted using a randomized complete block model analysis of variance for three sets of comparisons for each component in forage and grain: analyses for each of the two replicated trials, FS-3 and IT-4, and for a combination of both trials. There were a total of 51 components evaluated (7 in forage and 44 in grain). The 44 components in grain resulted from the difference between the initial 59 components minus the 15 components specified above that were excluded because their levels were below the LOD. A total of 153 comparisons were made: 51 comparisons for each of the three statistical analyses.

Individual replicated trial analyses used the model:

$$Y_{ij} = U + T_i + B_j + e_{ij},$$

where Y_{ij} = unique individual observation, U = overall mean, T_i = line effect, B_j = random block effect and e_{ij} = residual error.

Combined site analyses used the model:

$$Y_{ijk} = U + T_i + L_j + B(L)_{jk} + LT_{ij} + e_{ijk},$$

where Y_{ijk} = unique individual observation, U = overall mean, T_i = line effect, L_j = random location effect, $B(L)_{jk}$ = random block within location effect, LT_{ij} = random location by line interaction effect and e_{ijk} = residual error. The test event, NK603, was compared to the non-transgenic control line, LH82xB73BC2S2, to determine statistically significant differences at $p < 0.05$.

At two additional sites, FN-1 and FN-2, the test event NK603 and the non-transgenic control line were each grown at separate locations within the site due to space limitations. The test event and the control were each replicated on four plots. Due to the resulting incomplete block design and the lack of appropriate within-site blocking to account for location effects, results from these two sites were not included in the statistical analysis of variance for test event versus control line. Instead the means, standard errors (S.E.) and the range of observed values were calculated for each compositional component for each of the two sites.

Compositional analysis data for the commercial reference lines were not included in the statistical analysis of variance. However, the range of the reference values was determined for each compositional analysis component. Additionally, the commercial reference line data were used to develop population tolerance intervals. A tolerance interval is an interval with a specified degree of confidence, $100(1-\alpha)\%$, which contains at least a specified proportion, p, of an entire sampled population for the parameter measured. For each compositional analysis component, tolerance intervals were calculated that are expected to contain, with 95% confidence, 99% of the values expressed in the population of commercial lines. Because negative quantities are not possible, calculated lower tolerance bounds that were negative, were set to zero.

SAS® software (SAS Institute, 1999) was used to generate all summary statistics and perform all analyses. Report tables present p-values from SAS® as either <0.001 or the actual value truncated to three decimal places.

4.0 Results and Discussion

4.1 Test and Control Substances Characterization

The DNA from the grain samples of NK603 test event from all sites gave the expected molecular fingerprint indicating that event identity had been maintained. The control line, LH82xB73BC2S2, samples were confirmed as non-transgenic controls except for control sample number 875 from site FS-3 which was shown to be contaminated with NK603 transformation event. Both the control line grain sample (No. 875) and forage sample (No. 846) from this plot were not included in the compositional analysis. The elimination of these two samples should not effect the interpretation of the data. The characterization data were summarized in a study report which was archived with Study Plan 99-RR-01-F/It.

4.2 Compositional Analyses of Maize Tissues

The compositional analysis data and statistical evaluation for sites FS-3 and IT-4 are summarized in Tables 2-7. For each component, least-square means, standard errors and the range of observed values are presented for each line. In addition, mean differences between the test and control line, standard errors of the differences, the range of observed differences, 95% confidence intervals of the differences and the significance probabilities are presented for each comparison. Component values are expressed as follows: amino acids as % total amino acids; proximates (except moisture), ADF, NDF, calcium, magnesium, phosphorus, phytic acid and potassium as % dry weight; moisture as % fresh wt.; fatty acids as % total fatty acids; copper, iron, manganese and zinc as mg/kg dw; vitamin E as mg/g dw; and trypsin inhibitor in TIU/mg dw.

Fifty-one different biochemical components were evaluated as part of the safety and nutritional assessment of maize event NK603. The values for all the compositional components assessed in sites FS-3 and IT-4 were either within the range observed for commercial maize lines planted at the same E.U. sites in 1999, published literature ranges (Jugenheimer, 1976; Watson, 1982; Watson, 1987) or historical ranges for non-transgenic maize varieties (Sanders and Patzer, 1995; Sanders *et al.*, 1996a,b; 1997a,b,c) with the exception of one replicate value for tyrosine in site IT-4. This single replicate value for tyrosine (2.11 % of total amino acids) was below the lower boundary of 95 % tolerance interval for the commercial reference lines (3.00% of total amino acids). All other replicates values for tyrosine at this site and all tyrosine values at site FS-3 fell within the 95% tolerance interval. Therefore this minor difference is considered not biologically significant. The means and standard errors for sites FN-1 and FN-2 with an incomplete (treated/untreated) block design (Tables 8-11) were consistent with that obtained for sites FS-3 and IT-4.

Data were developed and statistical analyses conducted for three sets of comparisons: analyses for each of two replicated trials (FS-3 and IT-4) and for a combination of trials across both field sites. Therefore, a total of 153 comparisons were made: 51 comparisons for each of these three statistical analyses. These evaluations showed that there were no statistically significant differences in 126 of the 153 comparisons made between NK603 and the control line. Thus there were no statistically significant differences between NK603 and the control line for the content of moisture, fat, protein, ash, carbohydrate, ADF and NDF in forage, and for the content of ash, moisture, ADF, NDF, seven of 18 amino acids, two of eight fatty acids above the LOD, five of eight minerals, vitamin E and trypsin inhibitor in grain.

As shown in Table 1, statistically significant differences ($p<0.05$) between NK603 and control were seen for: histidine, 16:0 palmitic acid and total fat (two comparisons); alanine, arginine, glutamic acid, glycine, leucine, lysine, methionine, phenylalanine, proline, tryptophan, 18:0 stearic acid, 18:1 oleic acid, 18:2 linoleic acid, 18:2 linolenic acid, 20:0 arachidic acid,

manganese, potassium, zinc, carbohydrates, protein and phytic acid (one comparison). Of the 27 comparisons found to be statistically different, 5% or approximately eight (0.05 × 153), were expected to be false positives based on chance alone. Differences which were observed for only one to two of these comparisons, and not consistently across all three comparisons, are unlikely to be of biological significance. The magnitude of the differences as a percent of the control values ranged between 1.13%-22.39%. Furthermore, the range of values for those compositional components associated with the small statistically significant differences were found to all fall within the 95% tolerance interval for commercial varieties planted at the same E. U. sites in 1999 (Table 1). This demonstrates with a 95% confidence level that the levels of key nutrients and other compositional components for NK603 were within the same population as expected for non-transgenic corn. Therefore, these minor differences are unlikely to be biologically meaningful and the grain from NK603 is considered compositionally equivalent to that of conventional corn grain.

5.0 Conclusions

The results of compositional analyses showed that the 51 components measured in maize event NK603 were either within the range observed for commercial maize lines planted at the same E.U. sites in 1999, were within published literature ranges (Jugenheimer, 1976; Watson, 1982; Watson, 1987), or were within historical ranges for non-transgenic maize varieties (Sanders and Patzer, 1995; Sanders *et al.*, 1996a,b; 1997a,b,c). There were no statistically significant differences in 126 of the 153 comparisons made between the maize event NK630 (hybrid LH82xNK603+/B73BC2S2), and the control line(hybrid LH82xB73BC2S2), which included the levels of forage components (moisture, fat, protein, ash, carbohydrate, ADF and NDF) and grain components (ash, moisture, ADF, NDF, seven of 18 amino acids, two of eight fatty acids, five of eight minerals, vitamin E and trypsin inhibitor).

Of the 27 comparisons found to be statistically different, 5% or approximately eight (0.05 × 153), were expected to be false positives based on chance alone. Differences that were observed for only one or two of these comparisons, and not consistently across all three comparisons, are not considered to be biologically significant. The differences between the test event and the control line expressed as a percent of the control values ranged between 1.13%-22.93%. Furthermore, the range of values for those compositional components associated with the small statistical differences were found to all fall within the 95% tolerance interval for commercial varieties planted at the same E.U. sites in 1999. This demonstrates, with a confidence level of 95%, that the levels of key nutrients and other compositional components for NK603 were within the same population as expected for non-transgenic commercial reference maize used in this study. Therefore, these minor differences are unlikely to be biologically meaningful, and the grain and forage from NK603 are considered compositionally equivalent to that of conventional maize grain and forage.

These data support the conclusion that the Roundup Ready® maize event NK603 is compositionally equivalent and as safe and nutritious as the maize varieties grown commercially today.

6.0 Acknowledgments

The authors would like to acknowledge Mark Holland, Paul Pyla and Linda Lahman for critical review of this report; and Lavada Blount, Gary VanHorn and Jack Milligan for sample preparation and shipment.

7.0 References

AACC Method 32.20 (1998). *In* Approved Methods of the American Association of Cereal Chemists, 9th Edition.

AOAC International Methods 922.06 and 954.02 (2000). *In* Official Methods of Analysis of AOAC International, 17th Edition. Association of Official Analytical Chemists International, Gaithersburg, Maryland.

AOAC International Method 923.03 (2000). *In* Official Methods of Analysis of AOAC International, 17th Edition. Association of Official Analytical Chemists International, Gaithersburg, Maryland.

AOAC International Methods 926.08 and 925.09 (2000). *In* Official Methods of Analysis of AOAC International, 17th Edition. Association of Official Analytical Chemists International, Gaithersburg, Maryland.

AOAC International Methods 955.04 and 979.09 (2000). *In* Official Methods of Analysis of AOAC International, 17th Edition. Association of Official Analytical Chemists International, Gaithersburg, Maryland.

AOAC International Method 960.39 (2000). *In* Official Methods of Analysis of AOAC International, 17th Edition. Association of Official Analytical Chemists International, Gaithersburg, Maryland.

AOAC International Method 982.30 (2000). *In* Official Methods of Analysis of AOAC International, 17th Edition. Association of Official Analytical Chemists International, Gaithersburg, Maryland.

AOAC International Methods 984.27 and 985.01 (2000). *In* Official Methods of Analysis of AOAC International, 17th Edition. Association of Official Analytical Chemists International, Gaithersburg, Maryland.

AOCS Method Ba 12-75 (1997). *In* Official Methods and Recommended Practices of the American Oil Chemists Society, 5th Edition. American Oil Chemists Society, Champaign, Illinois.

AOCS Method Ce 1-62 (1997). *In* Official Methods and Recommended Practices of the American Oil Chemists Society, 5th Edition. American Oil Chemists Society, Champaign, Illinois.

Bradstreet, R.B. (1965). The Kjeldahl Method for Organic Nitrogen, Academic Press, New York, New York.

Cort, W.M., Vincente, T.S., Waysek, E.H. and Williams, B.D. (1983). Vitamin E Content of Feedstuffs Determined by High-Performance Liquid Chromatographic Flourescence. J. *Agric. Food Chem.* **31**: 1330-1333.

Dahlquist, R.L. and Knoll, J.W. (1978). Inductively Coupled Plasma-Atomic Emission Spectrometry: Analysis of Biological Materials and Soils for Major, Trace, and Ultra Trace Elements. *Appl. Spectroscopy* **32**: 1-29.

Deng, M.Y., Lirette, R.P., Cavato, T.A. and Sidhu, R.S. (1999). Molecular Characterization of Roundup Ready Corn Line NK603. Technical Report MSL-16214, Monsanto Company, St. Louis, MO.

Harrison, L., Bailey, M., Naylor, M., Ream, J., Hammond, B., Nida, D., Burnette, B., Nickson, T., Mitsky, T., Talor, M., Fuchs, R., and Padgette, S. (1996). The expressed protein in glyphosate-tolerant soybean, 5-enolypyryvylshikimate-3-phosphate synthase from *Agrobacterium* sp. strain CP4, is rapidly digested *in vitro* and is not toxic to acutely gavaged mice. *J. Nutr.* **126**: 728-740.

Haslam, E. (1993). Shikimic Acid: Metabolism and Metabolites. John Wiley and Sons, Chichester, England.

Jugenheimer, R.W. (1976). Maize Improvement, Seed Production, and Uses. John Wiley & Sons, Inc. New York, New York.

Kalthoff, I.M. and Sandell, E.B. (1948). Quantitative Inorganic Analysis, MacMillan, New York, New York.

Lehrfeld, J. (1989). High-Performance Liquid Chromatography Analysis of Phytic Acid on a pH-Stable, Macroporous Polymer Column. *Cereal Chem.* **66**: 510-515.

Lehrfeld, J. (1994). HPLC Separation and Quantitation of Phytic Acid and Some Inositol Phosphates in Foods: Problem and Solutions. *J. Agric. Food Chem.* **42**: 2726-2731.

Padgette, S., Barry, G., Re, D., Eichholtz, D., Weldon, M., Kolacz, K., and Kishore, G. (1993). Purification, cloning, and characterization of highly glyphosate-tolerant 5-enolpyruvylshikimate-3-phosphate synthase from *Agrobacterium* sp. strain CP4. Technical Report MSL-12738, Monsanto Company, St. Louis, MO.

Padgette, S., Kolacz, K., Delannay, X., Re, D., LaVallee, B., Tinnius, C., Rhodes, W., Otero, Y., Barry, G., Eixholtz, D., Peschke, V., Nida, D., Taylor, N., and Kishore, G. (1995). Development, Identification, and Characterization of a Glyphosate-Tolerant Soybean Line. *Crop Science*, **35**: 1451-1461.

Padgette, S., Re, D., Eichholtz, D., Delannay, X., Fuchs, R., Kishore, G., and Fraley, R. (1996). New weed control opportunities: Development of soybeans with a Roundup Ready™ gene. *In* Herbicide Resistant Crops. Duke, S.O., Ed.; CRC: Boca Raton, FL.; pp. 53-84.

Sanders, P.R. and Patzer, S.S. (1995). Compositional Analyses of MON 801 Grain and Silage from the 1993 and 1994 Maize Field Trials. Technical Report MSL-14180, Monsanto Company, St. Louis, MO.

Sanders, P.R., Henning, D.M., and Groth, M.E. (1996a). Compositional Analysis of Insect-Protected and Insect-Protected Roundup Ready™ Maize Lines from the 1994 U.S. Field Trials. Technical Report MSL-14326, Monsanto Company, St. Louis, MO.

Sanders, P.R., Groth, M.E., Ledesma, B.E. and Kania, J.R. (1996b). Evaluation of Insect Protected, Insect Protected Roundup Ready™, and Roundup Ready™ Maize Lines in the 1995 European Field Trial 95-BTRR-01. Technical Report MSL-14615, Monsanto Company, St. Louis, MO.

Sanders, P.R., Groth, M.E. and Ledesma, B. E. (1997a). Evaluation of Insect Protected Roundup Ready™ and Roundup Ready™ Maize Lines in the 1995 European Field Trial 95-BTRR-02. Technical Report MSL-14383, St. Louis, MO.

Sanders, P.R., Groth, M.E. and Ledesma, B.E. (1997b). Expression and Compositional Analyses of Roundup Ready™ Maize Lines MON 830, MON 831 and MON 832 in the 1995

U.S. Field Trial Following Treatment with Roundup® Herbicide. Technical Report MSL-15015, Monsanto Company, St. Louis, MO.

Sanders, P.R., Groth, M.E., Ledesma, B.E. and Kania, J.R. (1997c). Expression and Compositional Analyses of Roundup Ready™ Corn Lines MON 830, MON 831 and MON 832 in the 1995 U.S. Field Trials. Technical Report MSL-14724, Monsanto Company, St. Louis, MO.

SAS Institute Inc. (1999). *SAS OnlineDoc*™ Cary, NC: SAS Instituite Inc.

Steinrucken, H. and Amrhein, N. (1980). The herbicide glyphosate is a potent inhibitor of 5-enolypyryvylshikimic acid-3-phosphate synthase. *Biochem. Biophys. Res. Commun.* **94**: 1207-1212.

USDA Agriculture Handbook No. 74 (1973). Energy Value of Foods. *In* Agricultural Handbook No. 74. United States Department of Agriculture: Washington, D.C.; pp. 2-11.

USDA Agriculture Handbook No. 379 (1970). Forage and Fiber Analysis. *In* Agricultural Handbook No. 379. United States Department of Agriculture: Washington, D.C.

Vanbellinghen, C. (2000). Production of Roundup Ready® Maize Sample. 1999 Field Trials in France and Italy. Technical Report MLL-31430, Monsanto Company, St. Louis, MO.

Watson, S.A. (1982). Maize: Amazing Maize. General Properties. *In* CRC Handbook of Processing and Utilization in Agriculture, Volume II: Part 1 Plant Products. Wolff, I.A. Ed.; CRC Press, Inc.: Boca Raton, FL.; pp. 3-29.

Watson, S.A. (1987). Structure and composition. *In* Corn: Chemistry and Technology. Watson, S.A. and Ramstad, R.E., Eds.; American Association of Cereal Chemists, Inc.: St. Paul, MN; pp. 53-82.

Table 1. Summary of Statistical Results for the Comparison of NK603 to Control and Commercial Varieties

Tissue/ Component[a]	Site Code	Mean MON NK603[b]	Mean Control[b]	Mean Difference (NK603 minus Control)	Significance[b] (p-value)	Mean Difference[c] (% of Control Value)	NK603[b] (Range)	Commercial[b] (95% T. I.[d] Lower, Upper)
Grain								
Proline (% Total AA)	FS-3	9.54	9.26	0.28	0.033	3.02	(9.46-9.71)	(8.61,10.09)
Tryptophan (% Total AA)	FS-3	0.61	0.65	-0.04	0.047	-6.15	(0.55-0.63)	(0.45,0.76)
16:0 Palmitic (% Total FA)	FS-3	8.56	8.97	-0.41	0.034	-4.57	(8.47-8.66)	(7.35,14.72)
18:0 Stearic (% Total FA)	FS-3	1.61	1.68	-0.07	0.019	-4.17	(1.59-1.62)	(1.02,2.27)
18:1 Oleic (% Total FA)	FS-3	22.96	23.76	-0.80	0.027	-3.37	(22.82-23.13)	(12.65,39.86)
18:2 Linoleic (% Total FA)	FS-3	65.08	63.74	1.34	0.013	2.10	(64.92-65.25)	(44.59,73.50)
Phytic acid (% dw)	FS-3	0.82	0.67	0.15	0.037	22.39	(0.75-0.89)	(0.32,1.18)
Glycine (% Total AA)	IT-4	3.32	3.54	-0.22	0.013	-6.21	(3.23-3.39)	(3.06,4.15)
Histidine (% Total AA)	IT-4	2.64	2.74	-0.10	0.048	-3.65	(2.56-2.71)	(2.34,3.36)
Leucine (% Total AA)	IT-4	14.39	13.84	0.55	0.014	3.97	(14.09-14.71)	(11.73,14.76)
Phenylalanine (% Total AA)	IT-4	5.37	5.24	0.13	0.033	2.48	(5.33-5.46)	(4.59,5.61)
16:0 Palmitic (% Total FA)	IT-4	9.24	9.03	0.21	0.040	2.33	(9.09-9.36)	(7.35,14.72)
18:3 Linolenic (% Total FA)	IT-4	1.03	1.11	-0.08	0.010	-7.21	(0.97-1.05)	(0.54,1.72)
Manganese (mg/kg dw)	IT-4	7.67	7.11	0.56	0.039	7.88	(7.47-7.90)	(2.50,12.03)
Zinc (mg/kg dw)	IT-4	29.76	28.46	1.30	0.008	4.57	(28.81-31.45)	(9.89,31.52)
Carbohydrates (% dw)	IT-4	80.87	82.68	-1.81	0.008	-2.19	(80.49-81.44)	(79.38,88.91)
Fat, total (% dw)	IT-4	4.12	3.52	0.60	0.019	17.05	(3.87-4.36)	(1.55,5.75)
Protein (% dw)	IT-4	13.63	12.41	1.22	0.011	9.83	(13.32-13.92)	(6.84,14.57)
Alanine (% Total AA)	All	8.04	7.95	0.09	0.042	1.13	(7.87-8.18)	(7.20,8.35)
Arginine (% Total AA)	All	4.00	4.27	-0.27	0.019	-6.32	(3.74-4.27)	(3.45,5.03)
Glutamic acid (% Total AA)	All	19.93	19.40	0.53	0.009	2.73	(18.98-20.62)	(18.03,20.76)
Histidine (% Total AA)	All	2.65	2.77	-0.12	0.003	-4.33	(2.56-2.74)	(2.34,3.36)
Lysine (% Total AA)	All	2.71	2.83	-0.12	0.015	-4.24	(2.37-3.03)	(2.22,3.68)
Methionine (% Total AA)	All	1.77	1.89	-0.12	0.031	-6.35	(1.66-1.85)	(1.39,2.49)

(continued over)

Table 1. Summary of Statistical Results for the Comparison of NK603 to Control and Commercial Varieties (continued)

Tissue/ Component[a]	Site Code	Mean NK603[b]	Mean Control[b]	Mean Difference[b] (NK603 minus Control)	Significance[b] (p-value)	Mean Difference[c] (% of Control Value)	NK603[b] (Range)	Commercial[b] (95% Tolerance Int. Lower, Upper)
Grain								
20:0 Arachidic (% Total FA)	All	0.36	0.35	0.01	0.004	2.86	(0.34-0.39)	(0.17,0.64)
Potassium (% dw)	All	0.36	0.38	-0.02	0.008	-5.26	(0.34-0.38)	(0.31,0.45)
Fat, total (% dw)	All	4.16	3.60	0.56	<0.001	15.56	(3.87-4.48)	(1.55,5.75)

[a] dw = dry wt., AA = amino acids, FA = fatty acids.
[b] Data obtained from Tables 2-7.
[c] Calculated using the following expression: [Mean Difference = (NK603 minus Control)/Mean Control * 100].
[d] T.I. = tolerance interval, specified to contain 99% of the commercial line population, negative limits set to zero.

Table 2. Replicated Trial (Site FS-3): Fiber and Proximate Content of Forage and Statistical Summary

Component[a]	NK603	Control	Difference (NK603 minus Control)			Comm. Range[e]	Historical[g]
	Mean[b] ± S.E.[c] (Range)	Mean[b] ± S.E.[c] (Range)	Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	[95% T.I.[f] Lower, Upper]	Range
Ash (% DW)	3.58 ± 0.27 (2.82 - 4.07)	3.79 ± 0.31 (3.35 - 4.36)	-0.21 ± 0.41 (-1.54 - 0.46)	0.656	-1.96,1.54	(2.43 - 9.64) [0,12.47]	2.9 - 5.1
Carbohydrates (% dw)	85.62 ± 0.64 (84.87 - 87.53)	84.46 ± 0.73 (83.08 - 85.52)	1.17 ± 0.81 (-0.40 - 2.50)	0.287	-2.33,4.66	(76.50 - 87.29) [75.55,91.37]	84.6 - 89.1
ADF (% dw)	22.54 ± 1.12 (19.27 - 25.99)	20.11 ± 1.30 (19.39 - 21.31)	2.43 ± 1.72 (0.65 - 6.37)	0.292	-4.96,9.82	(17.54 - 38.31) [9.80,44.43]	21.4 - 29.2
NDF (% dw)	35.23 ± 1.65 (31.77 - 38.21)	36.54 ± 1.78 (34.85 - 41.86)	-1.31 ± 1.42 (-3.65 - 1.22)	0.453	-7.43,4.81	(27.93 - 54.75) [20.77,61.87]	39.9 - 46.6
Moisture (% fw)	62.85 ± 0.89 (61.60 - 63.40)	62.90 ± 1.02 (60.40 - 65.60)	-0.050 ± 1.35 (-2.50 - 3.00)	0.973	-5.88,5.78	(56.50 - 80.40) [45.40,96.42]	68.7 - 73.5
Protein (% dw)	7.38 ± 0.45 (6.37 - 7.89)	8.06 ± 0.50 (7.03 - 9.24)	-0.68 ± 0.53 (-1.81 - 0.15)	0.327	-2.95,1.60	(4.98 - 11.56) [4.02,12.46]	4.8 - 8.4
Total fat (% dw)	3.42 ± 0.12 (3.24 - 3.62)	3.74 ± 0.12 (3.46 - 4.02)	-0.32 ± 0.081 (-0.49 - -0.22)	0.057	-0.67,0.025	(1.42 - 4.57) [0.84,4.80]	1.4 - 2.1

[a]ADF = acid detergent fiber; NDF = neutral detergent fiber; dw = dry wt.; fw = fresh wt.
[b]The mean of four replicate values.
[c]S.E. = standard error of the mean.
[d]C.I. = confidence interval.
[e]The range of sample values for commercial lines grown at the same E.U. sites in 1999.
[f]T.I = tolerance interval, specified to contain 99% of commercial line population, negative limits set to zero.
[g]Range for control lines analyzed in Monsanto Company trials conducted in 1994 and 1995 (Sanders *et al.*, 1996b; 1997a)

Table 3. Replicated Trial (Site FS-3): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Amino acids (% of total)								
Alanine	8.04 ± 0.033 (7.95 - 8.12)	8.00 ± 0.037 (7.99 - 8.05)	0.047 ± 0.034 (0.015 - 0.12)	0.295	-0.098,0.19	(7.38 - 8.13) [7.20,8.35]	6.4-9.9	7.2-8.8
Arginine	4.01 ± 0.11 (3.74 - 4.24)	4.27 ± 0.12 (4.18 - 4.36)	-0.26 ± 0.16 (-0.55 - -0.021)	0.252	-0.96,0.44	(3.77 - 4.98) [3.45,5.03]	2.9-5.9	3.5-5.0
Aspartic acid	6.58 ± 0.10 (6.42 - 6.96)	6.27 ± 0.12 (6.25 - 6.32)	0.31 ± 0.14 (0.19 - 0.64)	0.154	-0.28,0.90	(6.02 - 7.51) [5.53,7.61]	5.8-7.2	6.3-7.5
Cystine	1.89 ± 0.042 (1.77 - 1.98)	1.94 ± 0.048 (1.89 - 1.98)	-0.048 ± 0.064 (-0.19 - 0.090)	0.530	-0.32,0.23	(1.68 - 2.51) [1.56,2.43]	1.2-1.6	1.8-2.7
Glutamic acid	19.58 ± 0.22 (18.98 - 20.08)	18.87 ± 0.26 (18.69 - 19.02)	0.70 ± 0.34 (-0.043 - 1.39)	0.176	-0.77,2.18	(18.38 - 20.08) [18.03,20.76]	12.4-19.6	18.6-22.8
Glycine	3.56 ± 0.049 (3.42 - 3.64)	3.66 ± 0.056 (3.60 - 3.77)	-0.10 ± 0.065 (-0.19 - 0.044)	0.253	-0.38,0.18	(3.27 - 4.01) [3.06,4.15]	2.6-4.7	3.2-4.2
Histidine	2.67 ± 0.023 (2.62 - 2.74)	2.81 ± 0.027 (2.78 - 2.85)	-0.14 ± 0.036 (-0.22 - -0.039)	0.057	-0.29,0.011	(2.58 - 3.15) [2.34,3.36]	2.0-2.8	2.8-3.4
Isoleucine	3.74 ± 0.060 (3.54 - 3.87)	3.70 ± 0.067 (3.61 - 3.74)	0.033 ± 0.064 (-0.071 - 0.15)	0.652	-0.24,0.31	(3.34 - 3.85) [3.35,3.97]	2.6-4.0	3.2-4.3
Leucine	13.66 ± 0.13 (13.38 - 14.03)	13.56 ± 0.15 (13.27 - 13.77)	0.10 ± 0.20 (-0.40 - 0.41)	0.658	-0.77,0.98	(12.18 - 14.34) [11.73,14.76]	7.8-15.2	12.0-15.8

(continued over)

Table 3. Replicated Trial (Site FS-3): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Lysine	2.86 ± 0.078 (2.73 - 3.03)	2.97 ± 0.083 (2.80 - 3.20)	-0.11 ± 0.058 (-0.17 - 0.012)	0.202	-0.36,0.14	(2.58 - 3.67) [2.22,3.68]	2.0-3.8	2.6-3.5
Methionine	1.78 ± 0.036 (1.66 - 1.85)	1.87 ± 0.042 (1.85 - 1.90)	-0.096 ± 0.056 (-0.24 - -0.023)	0.225	-0.34,0.14	(1.49 - 2.32) [1.39,2.49]	1.0-2.1	1.3-2.6
Phenylalanine	5.19 ± 0.023 (5.13 - 5.26)	5.25 ± 0.025 (5.21 - 5.29)	-0.061 ± 0.024 (-0.11 - -0.030)	0.125	-0.16,0.042	(4.85 - 5.54) [4.59,5.61]	2.9-5.7	4.9-6.1
Proline	9.54 ± 0.048 (9.46 - 9.71)	9.26 ± 0.053 (9.23 - 9.31)	0.28 ± 0.052 (0.23 - 0.40)	0.033	0.054,0.50	(8.74 - 9.91) [8.61,10.09]	6.6-10.3	8.7-10.1
Serine	4.72 ± 0.12 (4.47 - 5.17)	4.98 ± 0.14 (4.92 - 5.09)	-0.26 ± 0.15 (-0.45 - 0.081)	0.224	-0.90,0.38	(4.41 - 5.22) [4.36,5.19]	4.2-5.5	4.9-6.0
Threonine	3.31 ± 0.075 (3.14 - 3.57)	3.36 ± 0.081 (3.29 - 3.50)	-0.044 ± 0.060 (-0.15 - 0.069)	0.535	-0.30,0.21	(3.24 - 3.66) [3.14,3.69]	2.9-3.9	3.3-4.2
Tryptophan	0.61 ± 0.020 (0.55 - 0.63)	0.65 ± 0.021 (0.59 - 0.69)	-0.039 ± 0.0088 (-0.056 - -0.025)	0.047	-0.077,-0.0012	(0.49 - 0.79) [0.45,0.76]	0.5-1.2	0.4-1.0
Tyrosine	3.36 ± 0.13 (2.94 - 3.63)	3.65 ± 0.15 (3.60 - 3.66)	-0.29 ± 0.18 (-0.66 - -0.021)	0.252	-1.08,0.50	(2.32 - 3.90) [3.00,4.03]	2.9-4.7	3.7-4.3
Valine	4.92 ± 0.064 (4.75 - 5.00)	4.94 ± 0.067 (4.74 - 5.04)	-0.019 ± 0.034 (-0.090 - 0.021)	0.633	-0.17,0.13	(4.65 - 5.29) [4.64,5.38]	2.1-5.2	4.2-5.3

(continued over)

Table 3. Replicated Trial (Site FS-3): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Fatty acids (% of total)								
16:0 palmitic acid	8.56 ± 0.052 (8.47 - 8.66)	8.97 ± 0.060 (8.89 - 9.13)	-0.42 ± 0.080 (-0.66 - -0.24)	0.034	-0.76,-0.072	(9.12 - 12.62) [7.35,14.72]	7-19	9.9-12.0
18:0 stearic acid	1.61 ± 0.0066 (1.59 - 1.62)	1.68 ± 0.0076 (1.67 - 1.69)	-0.071 ± 0.010 (-0.083 - -0.044)	0.019	-0.11,-0.028	(1.19 - 2.02) [1.02,2.27]	1-3	1.4-2.2
18:1 oleic acid	22.96 ± 0.088 (22.82 - 23.13)	23.76 ± 0.10 (23.52 - 23.99)	-0.80 ± 0.13 (-1.16 - -0.55)	0.027	-1.38,-0.22	(20.21 - 34.64) [12.65,39.86]	20-46	20.6-27.5
18:2 linoleic acid	65.08 ± 0.10 (64.92 - 65.25)	63.74 ± 0.12 (63.58 - 64.04)	1.34 ± 0.16 (0.87 - 1.66)	0.013	0.66,2.02	(49.72 - 65.98) [44.59,73.50]	35-70	55.9-66.1
18:3 linolenic acid	1.02 ± 0.0088 (0.99 - 1.03)	1.06 ± 0.010 (1.05 - 1.07)	-0.041 ± 0.013 (-0.082 - -0.012)	0.091	-0.099,0.016	(0.71 - 1.50) [0.54,1.72]	0.8-2	0.8-1.1
20:0 arachidic acid	0.35 ± 0.0032 (0.34 - 0.36)	0.34 ± 0.0035 (0.33 - 0.34)	0.011 ± 0.0033 (0.0050 - 0.016)	0.076	-0.0029,0.025	(0.31 - 0.74) [0.17,0.64]	0.1-2	0.3-0.5
20:1 eicosenoic acid	0.29 ± 0.0039 (0.28 - 0.30)	0.28 ± 0.0045 (0.28 - 0.29)	0.0052 ± 0.0060 (-0.0022 - 0.016)	0.478	-0.021,0.031	(0.26 - 0.40) [0.21,0.42]	na	0.2-0.3
22:0 behenic acid	0.14 ± 0.0074 (0.12 - 0.16)	0.16 ± 0.0079 (0.15 - 0.18)	-0.025 ± 0.0062 (-0.034 - -0.013)	0.057	-0.051,0.0020	(0.073 - 0.22) [0.093,0.24]	na	0.1-0.3

(continued over)

Table 3. Replicated Trial (Site FS-3): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Minerals								
Calcium (% dw)	0.0051 ± 0.00014 (0.0050- 0.0052)	0.0053 ± 0.00016 (0.0050 - 0.0057)	-0.00012 ± 0.00022 (-0.00056 - 0.00021)	0.646	-0.0010,0.00081	(0.0039 - 0.0076) [0.0028,0.0082]	0.01-0.1	0.003-0.006
Copper (mg/kg dw)	1.90 ± 0.053 (1.77 - 1.99)	1.81 ± 0.061 (1.69 - 1.92)	0.089 ± 0.081 (-0.15 - 0.27)	0.388	-0.26,0.44	(1.16 - 2.78) [0.45,3.16]	0.9-10	na
Iron (mg/kg dw)	19.50 ± 0.63 (17.43 - 21.15)	18.97 ± 0.72 (18.52 - 19.63)	0.53 ± 0.96 (-1.32 - 2.63)	0.632	-3.58,4.65	(15.42 - 29.34) [10.60,33.63]	1-100	na
Magnesium (% dw)	0.11 ± 0.0037 (0.096 - 0.11)	0.10 ± 0.0043 (0.10 - 0.11)	0.0026 ± 0.0055 (-0.0063 - 0.012)	0.675	-0.021,0.026	(0.089 - 0.15) [0.079,0.16]	0.09-1.0	na
Manganese (mg/kg dw)	5.79 ± 0.16 (5.18 - 6.07)	5.73 ± 0.19 (5.63 - 5.80)	0.052 ± 0.25 (-0.59 - 0.37)	0.854	-1.01,1.12	(3.86 - 10.47) [2.50,12.03]	0.7-54	na
Phosphorus (% dw)	0.34 ± 0.012 (0.31 - 0.36)	0.34 ± 0.014 (0.32 - 0.36)	0.00033 ± 0.018 (-0.033 - 0.035)	0.986	-0.077,0.077	(0.27 - 0.39) [0.27,0.42]	0.26-0.75	0.288-0.363
Potassium (% dw)	0.35 ± 0.0079 (0.34 - 0.37)	0.37 ± 0.0091 (0.36 - 0.39)	-0.016 ± 0.012 (-0.047 - 0.010)	0.310	-0.068,0.036	(0.32 - 0.45) [0.31,0.45]	0.32-0.72	na
Zinc (mg/kg dw)	17.79 ± 0.58 (15.95 - 19.47)	17.93 ± 0.66 (17.87 - 18.00)	-0.14 ± 0.85 (-1.93 - 1.46)	0.888	-3.81,3.54	(13.51 - 27.98) [9.89,31.52]	12-30	na

(continued over)

Table 3. Replicated Trial (Site FS-3): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Fiber and Proximates								
Ash (% dw)	1.38 ± 0.074 (1.24 - 1.65)	1.26 ± 0.085 (1.25 - 1.27)	0.12 ± 0.11 (-0.025 - 0.40)	0.399	-0.37,0.61	(1.02 - 1.94) [0.77,2.22]	1.1-3.9	1.2-1.8
Carbohydrates (% dw)	83.92 ± 0.19 (83.47 - 84.57)	84.82 ± 0.22 (84.76 - 84.92)	-0.91 ± 0.29 (-1.10 - -0.21)	0.087	-2.14,0.33	(82.18 - 88.14) [79.38,88.91]	na	81.7-86.3
ADF (% dw)	3.05 ± 0.25 (2.63 - 3.74)	2.72 ± 0.27 (2.30 - 3.10)	0.33 ± 0.26 (-0.24 - 0.59)	0.333	-0.80,1.46	(2.46 - 6.33) [1.96,4.71]	3.3 - 4.3	3.1 - 5.3
NDF (% dw)	9.34 ± 0.61 (8.50 - 11.48)	10.04 ± 0.71 (9.35 - 10.95)	-0.70 ± 0.94 (-2.07 - 2.12)	0.531	-4.74,3.33	(8.45 - 14.75) [7.26,14.64]	8.3-11.9	9.6 - 15.3
Moisture (% fw)	7.70 ± 0.11 (7.53 - 7.82)	7.92 ± 0.13 (7.68 - 8.28)	-0.21 ± 0.17 (-0.63 - 0.14)	0.345	-0.97,0.54	(7.43 - 9.94) [7.06,9.53]	7-23	9.4 - 15.8
Total fat (% dw)	4.20 ± 0.13 (3.95 - 4.48)	3.71 ± 0.14 (3.38 - 3.84)	0.49 ± 0.13 (0.20 - 0.62)	0.062	-0.064,1.05	(2.57 - 4.95) [1.55,5.75]	3.1-5.7, 2.9-6.1	2.4-4.2
Protein (% dw)	10.50 ± 0.11 (10.23 - 10.72)	10.27 ± 0.12 (10.13 - 10.45)	0.24 ± 0.16 (-0.071 - 0.59)	0.277	-0.46,0.93	(7.77 - 12.99) [6.84,14.57]	6.0 - 12.0, 9.7 - 16.1	9.0 - 13.6

(continued over)

Table 3. Replicated Trial (Site FS-3): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Miscellaneous								
Phytic Acid (% dw)	0.82 ± 0.037 (0.75 - 0.89)	0.67 ± 0.040 (0.55 - 0.71)	0.15 ± 0.029 (0.094 - 0.20)	0.037	0.022,0.27	(0.48 - 1.12) [0.32,1.18]	to 0.9%	na
Trypsin Inhibitor (TIU/mg dw)	0.79 ± 0.32 (0.54 - 1.53)	0.97 ± 0.33 (0.54 - 2.05)	-0.18 ± 0.17 (-0.52 - -0.0015)	0.390	-0.91,0.54	(0.54 - 4.13) [0,3.63]	na	na
Vitamin E (mg/g dw)	0.0053 ± 0.00018 (0.0048 - 0.0058)	0.0057 ± 0.00020 (0.0056 - 0.0059)	-0.00040 ± 0.00027 (-0.00099 - -0.00010)	0.275	-0.0016,0.00076	(0.0027 - 0.015) [0,0.021]	0.017-0.047	0.008-0.015

[a]ADF = acid detergent fiber; NDF = neutral detergent fiber; dw = dry wt.; fw = fresh wt; TIU = trypsin inhibitor units.
[b]The mean of four replicate values.
[c]S.E. = standard error of the mean.
[d]C.I. = confidence interval.
[e]Comm. = commercial. The range of sample values for commercial lines grown at the same E.U. sites in 1999.
[f]T. I. = tolerance interval, specified to contain 99% of the commercial line population, negative limits set to zero.
[g]Lit. = literature. For amino and fatty acids, Watson, 1982; for all other components, Watson, 1987; protein and fat second values from Jugenheimer, 1976.
[h]Hist. = historical. Range for control lines analyzed in Monsanto trials conducted between 1993 and 1995 (Sanders and Patzer, 1995; Sanders *et al.*, 1996a,b; 1997a,b,c).

Table 4. Replicated Trial (Site IT-4): Fiber and Proximate Content of Forage and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Historical[g] Range
Ash (% dw)	5.18 ± 0.49 (3.85 - 6.44)	5.10 ± 0.49 (3.93 - 5.80)	0.076 ± 0.69 (-1.89 - 1.52)	0.919	-2.11,2.26	(2.43 - 9.64) [0,12.47]	2.9 - 5.1
Carbohydrates (% dw)	81.71 ± 0.80 (80.43 - 83.06)	82.78 ± 0.80 (80.64 - 84.77)	-1.07 ± 0.98 (-3.57 - 0.63)	0.354	-4.20,2.05	(76.50 - 87.29) [75.55,91.37]	84.6 - 89.1
ADF (% dw)	24.52 ± 0.89 (23.05 - 26.13)	23.84 ± 0.89 (21.91 - 26.90)	0.68 ± 1.26 (-3.02 - 2.96)	0.627	-3.34,4.70	(17.54 - 38.31) [9.80,44.43]	21.4 - 29.2
NDF (% dw)	39.46 ± 1.55 (34.12 - 44.35)	38.56 ± 1.55 (37.16 - 39.78)	0.89 ± 2.19 (-3.84 - 7.19)	0.710	-6.07,7.85	(27.93 - 54.75) [20.77,61.87]	39.9 - 46.6
Moisture (% fw)	72.20 ± 1.32 (69.90 - 75.20)	69.85 ± 1.32 (66.90 - 72.60)	2.35 ± 1.87 (-2.40 - 8.30)	0.297	-3.60,8.30	(56.50 - 80.40) [45.40,96.42]	68.7 - 73.5
Protein (% dw)	10.05 ± 0.40 (9.30 - 10.79)	9.70 ± 0.40 (8.94 - 10.96)	0.35 ± 0.42 (-0.37 - 1.52)	0.470	-1.00,1.70	(4.98 - 11.56) [4.02,12.46]	4.8 - 8.4
Total fat (% dw)	3.07 ± 0.39 (2.06 - 4.49)	2.42 ± 0.39 (2.09 - 2.86)	0.65 ± 0.35 (-0.034 - 1.63)	0.162	-0.47,1.76	(1.42 - 4.57) [0.84,4.80]	1.4 - 2.1

[a]ADF = acid detergent fiber; NDF = neutral detergent fiber; dw = dry wt.; fw = fresh wt.
[b]The mean of four replicate values.
[c]S.E. = standard error of the mean.
[d]C.I. = confidence interval.
[e]The range of sample values for commercial lines grown at the same E.U. sites in 1999.
[f]T. I. = tolerance interval, specified to contain 99% of the commercial line population, negative limits set to zero.
[g]Range for control lines analyzed in Monsanto Company trials conducted in 1994 and 1995 (Sanders *et al.*, 1996b; 1997a).

Table 5. Replicated Trial (Site IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Amino acids (% of total)								
Alanine	8.03 ± 0.047 (7.87 - 8.18)	7.92 ± 0.047 (7.88 - 7.96)	0.11 ± 0.055 (-0.039 - 0.22)	0.128	-0.060,0.29	(7.38 - 8.13) [7.20,8.35]	6.4-9.9	7.2-8.8
Arginine	4.00 ± 0.085 (3.76 - 4.27)	4.26 ± 0.085 (4.09 - 4.35)	-0.26 ± 0.097 (-0.39 - 0.032)	0.077	-0.57,0.053	(3.77 - 4.98) [3.45,5.03]	2.9-5.9	3.5-5.0
Aspartic acid	6.33 ± 0.032 (6.27 - 6.37)	6.29 ± 0.032 (6.18 - 6.37)	0.042 ± 0.041 (-0.035 - 0.15)	0.381	-0.089,0.17	(6.02 - 7.51) [5.53,7.61]	5.8-7.2	6.3-7.5
Cystine	1.74 ± 0.076 (1.66 - 1.83)	1.89 ± 0.076 (1.61 - 2.09)	-0.15 ± 0.11 (-0.35 - 0.22)	0.257	-0.49,0.19	(1.68 - 2.51) [1.56,2.43]	1.2-1.6	1.8-2.7
Glutamic acid	20.28 ± 0.10 (19.92 - 20.62)	19.89 ± 0.10 (19.85 - 19.92)	0.40 ± 0.13 (0.072 - 0.73)	0.060	-0.033,0.82	(18.38 - 20.08) [18.03,20.76]	12.4-19.6	18.6-22.8
Glycine	3.32 ± 0.044 (3.23 - 3.39)	3.54 ± 0.044 (3.44 - 3.67)	-0.22 ± 0.041 (-0.31 - -0.12)	0.013	-0.35,-0.085	(3.27 - 4.01) [3.06,4.15]	2.6-4.7	3.2-4.2
Histidine	2.64 ± 0.033 (2.56 - 2.71)	2.74 ± 0.033 (2.69 - 2.84)	-0.10 ± 0.032 (-0.18 - -0.027)	0.048	-0.21,-0.00098	(2.58 - 3.15) [2.34,3.36]	2.0-2.8	2.8-3.4
Isoleucine	3.80 ± 0.066 (3.62 - 3.97)	3.81 ± 0.066 (3.79 - 3.85)	-0.016 ± 0.083 (-0.17 - 0.16)	0.859	-0.28,0.25	(3.34 - 3.85) [3.35,3.97]	2.6-4.0	3.2-4.3
Leucine	14.39 ± 0.098 (14.09 - 14.71)	13.84 ± 0.098 (13.70 - 13.96)	0.55 ± 0.11 (0.27 - 0.76)	0.014	0.21,0.89	(12.18 - 14.34) [11.73,14.76]	7.8-15.2	12.0-15.8

(continued over)

Table 5. Replicated Trial (Site IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Lysine	2.57 ± 0.082 (2.37 - 2.77)	2.70 ± 0.082 (2.56 - 2.94)	-0.13 ± 0.054 (-0.26 - -0.0069)	0.096	-0.30,0.042	(2.58 - 3.67) [2.22,3.68]	2.0-3.8	2.6-3.5
Methionine	1.77 ± 0.060 (1.75 - 1.79)	1.90 ± 0.060 (1.67 - 2.06)	-0.13 ± 0.085 (-0.32 - 0.12)	0.213	-0.40,0.14	(1.49 - 2.32) [1.39,2.49]	1.0-2.1	1.3-2.6
Phenylalanine	5.37 ± 0.024 (5.33 - 5.46)	5.24 ± 0.024 (5.20 - 5.28)	0.13 ± 0.035 (0.056 - 0.23)	0.033	0.018,0.24	(4.85 - 5.54) [4.59,5.61]	2.9-5.7	4.9-6.1
Proline	9.12 ± 0.090 (8.89 - 9.21)	9.04 ± 0.090 (8.83 - 9.31)	0.083 ± 0.11 (-0.13 - 0.38)	0.513	-0.28,0.44	(8.74 - 9.91) [8.61,10.09]	6.6-10.3	8.7-10.1
Serine	4.96 ± 0.047 (4.85 - 5.09)	4.83 ± 0.047 (4.82 - 4.85)	0.13 ± 0.066 (-0.0022 - 0.25)	0.143	-0.080,0.34	(4.41 - 5.22) [4.36,5.19]	4.2-5.5	4.9-6.0
Threonine	3.31 ± 0.044 (3.21 - 3.42)	3.25 ± 0.044 (3.15 - 3.34)	0.068 ± 0.062 (-0.083 - 0.22)	0.353	-0.13,0.27	(3.24 - 3.66) [3.14,3.69]	2.9-3.9	3.3-4.2
Tryptophan	0.55 ± 0.026 (0.49 - 0.64)	0.59 ± 0.026 (0.57 - 0.62)	-0.037 ± 0.035 (-0.13 - 0.027)	0.367	-0.15,0.074	(0.49 - 0.79) [0.45,0.76]	0.5-1.2	0.4-1.0
Tyrosine	3.12 ± 0.31 (2.11 - 3.65)	3.41 ± 0.31 (2.69 - 3.69)	-0.30 ± 0.42 (-1.53 - 0.37)	0.530	-1.64,1.04	(2.32 - 3.90) [3.00,4.03]	2.9-4.7	3.7-4.3
Valine	4.70 ± 0.063 (4.55 - 4.85)	4.87 ± 0.063 (4.83 - 4.95)	-0.17 ± 0.072 (-0.30 - -0.0092)	0.095	-0.40,0.056	(4.65 - 5.29) [4.64,5.38]	2.1-5.2	4.2-5.3

(continued over)

Table 5. Replicated Trial (Site IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Fatty acids (% of total)								
16:0 palmitic acid	9.24 ± 0.045 (9.09 - 9.36)	9.03 ± 0.045 (8.96 - 9.08)	0.20 ± 0.058 (0.071 - 0.32)	0.040	0.016,0.39	(9.12 - 12.62) [7.35,14.72]	7-19	9.9-12.0
18:0 stearic acid	1.84 ± 0.016 (1.79 - 1.88)	1.79 ± 0.016 (1.78 - 1.81)	0.050 ± 0.023 (-0.015 - 0.10)	0.118	-0.024,0.12	(1.19 - 2.02) [1.02,2.27]	1-3	1.4-2.2
18:1 oleic acid	24.65 ± 0.31 (24.27 - 24.95)	24.67 ± 0.31 (23.73 - 25.56)	-0.018 ± 0.44 (-0.85 - 1.22)	0.969	-1.42,1.38	(20.21 - 34.64) [12.65,39.86]	20-46	20.6-27.5
18:2 linoleic acid	62.38 ± 0.35 (61.94 - 62.96)	62.55 ± 0.35 (61.63 - 63.59)	-0.17 ± 0.49 (-1.65 - 0.89)	0.757	-1.74,1.40	(49.72 - 65.98) [44.59,73.50]	35-70	55.9-66.1
18:3 linolenic acid	1.03 ± 0.013 (0.97 - 1.05)	1.11 ± 0.013 (1.10 - 1.12)	-0.088 ± 0.015 (-0.13 - -0.057)	0.010	-0.14,-0.040	(0.71 - 1.50) [0.54,1.72]	0.8-2	0.8-1.1
20:0 arachidic acid	0.37 ± 0.0042 (0.36 - 0.39)	0.36 ± 0.0042 (0.36 - 0.37)	0.0093 ± 0.0038 (0.0010 - 0.019)	0.091	-0.0028,0.021	(0.31 - 0.74) [0.17,0.64]	0.1-2	0.3-0.5
20:1 eicosenoic acid	0.32 ± 0.0074 (0.30 - 0.34)	0.30 ± 0.0074 (0.29 - 0.31)	0.020 ± 0.010 (-0.0034 - 0.042)	0.148	-0.013,0.053	(0.26 - 0.40) [0.21,0.42]	na	0.2-0.3
22:0 behenic acid	0.18 ± 0.0068 (0.16 - 0.20)	0.19 ± 0.0068 (0.17 - 0.19)	-0.0080 ± 0.0084 (-0.028 - 0.0085)	0.415	-0.035,0.019	(0.073 - 0.22) [0.093,0.24]	na	0.1-0.3

(continued over)

Table 5. Replicated Trial (Site IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Minerals								
Calcium (% dw)	0.0054 ± 0.00016 (0.0052 - 0.0058)	0.0054 ± 0.00016 (0.0050 - 0.0058)	0.00003 ± 0.00022 (-0.00059 - 0.00059)	0.906	-0.00067,0.00073	(0.0039 - 0.0076) [0.0028,0.0082]	0.01-0.1	0.003-0.006
Copper (mg/kg dw)	1.88 ± 0.043 (1.82 - 1.98)	1.85 ± 0.043 (1.74 - 1.97)	0.025 ± 0.061 (-0.14 - 0.15)	0.705	-0.17,0.22	(1.16 - 2.78) [0.45,3.16]	0.9-10	na
Iron (mg/kg dw)	25.96 ± 0.48 (24.70 - 26.91)	24.71 ± 0.48 (24.15 - 25.87)	1.25 ± 0.47 (0.26 - 2.52)	0.075	-0.24,2.75	(15.42 - 29.34) [10.60,33.63]	1-100	na
Magnesium (% dw)	0.13 ± 0.0024 (0.12 - 0.13)	0.12 ± 0.0024 (0.11 - 0.12)	0.0093 ± 0.0034 (-0.00088 - 0.013)	0.071	-0.0015,0.020	(0.089 - 0.15) [0.079,0.16]	0.09-1.0	na
Manganese (mg/kg dw)	7.67 ± 0.14 (7.47 - 7.90)	7.11 ± 0.14 (6.61 - 7.32)	0.56 ± 0.16 (0.14 - 0.92)	0.039	0.050,1.07	(3.86 - 10.47) [2.50,12.03]	0.7-54	na
Phosphorus (% dw)	0.38 ± 0.0065 (0.36 - 0.39)	0.36 ± 0.0065 (0.35 - 0.37)	0.019 ± 0.0093 (-0.0080 - 0.034)	0.127	-0.010,0.049	(0.27 - 0.39) [0.27,0.42]	0.26-0.75	0.288-0.363
Potassium (% dw)	0.36 ± 0.0060 (0.34 - 0.38)	0.38 ± 0.0060 (0.37 - 0.39)	-0.024 ± 0.0085 (-0.036 - 0.0027)	0.064	-0.051,0.0028	(0.32 - 0.45) [0.31,0.45]	0.32-0.72	na
Zinc (mg/kg dw)	29.76 ± 0.60 (28.81 - 31.45)	28.46 ± 0.60 (27.07 - 29.88)	1.30 ± 0.21 (0.92 - 1.73)	0.008	0.64,1.96	(13.51 - 27.98) [9.89,31.52]	12-30	na

(continued over)

Table 5. Replicated Trial (Site IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Fiber/Proximates								
Ash (% dw)	1.38 ± 0.057 (1.23 - 1.51)	1.40 ± 0.057 (1.29 - 1.50)	-0.016 ± 0.080 (-0.25 - 0.11)	0.853	-0.27,0.24	(1.02 - 1.94) [0.77,2.22]	1.1-3.9	1.2-1.8
Carbohydrates (% dw)	80.87 ± 0.28 (80.49 - 81.44)	82.68 ± 0.28 (81.93 - 83.35)	-1.80 ± 0.30 (-2.66 - -1.38)	0.008	-2.75,-0.86	(82.18 - 88.14) [79.38,88.91]	na	81.7-86.3
ADF (% dw)	3.37 ± 0.16 (3.02 - 3.87)	3.27 ± 0.16 (3.04 - 3.68)	0.10 ± 0.099 (-0.19 - 0.27)	0.377	-0.21,0.42	(2.46 - 6.33) [1.96,4.71]	3.3 - 4.3	3.1 - 5.3
NDF (% dw)	10.82 ± 0.43 (9.72 - 12.00)	11.10 ± 0.43 (10.39 - 11.63)	-0.29 ± 0.55 (-1.46 - 1.17)	0.640	-2.04,1.47	(8.45 - 14.75) [7.26,14.64]	8.3-11.9	9.6 - 15.3
Moisture (% fw)	7.55 ± 0.096 (7.34 - 7.71)	7.71 ± 0.096 (7.55 - 8.02)	-0.17 ± 0.14 (-0.68 - 0.16)	0.304	-0.60,0.26	(7.43 - 9.94) [7.06,9.53]	7-23	9.4 - 15.8
Total fat (% dw)	4.12 ± 0.10 (3.87 - 4.36)	3.52 ± 0.10 (3.24 - 3.69)	0.60 ± 0.13 (0.26 - 0.82)	0.019	0.18,1.02	(2.57 - 4.95) [1.55,5.75]	3.1-5.7, 2.9-6.1	2.4-4.2 2.4-4.2
Protein (% dw)	13.63 ± 0.21 (13.32 - 13.92)	12.41 ± 0.21 (11.91 - 13.05)	1.22 ± 0.22 (0.84 - 1.75)	0.011	0.52,1.92	(7.77 - 12.99) [6.84,14.57]	6.0 - 12.0, 9.7 - 16.1	9.0 - 13.6

(continued over)

Table 5. Replicated Trial (Site IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Miscellaneous								
Phytic Acid (% dw)	0.75 ± 0.059 (0.51 - 0.87)	0.73 ± 0.059 (0.69 - 0.77)	0.019 ± 0.084 (-0.26 - 0.15)	0.839	-0.25,0.29	(0.48 - 1.12) [0.32,1.18]	to 0.9%	na
Trypsin Inhibitor (TIU/mg dw)	2.34 ± 0.29 (1.98 - 2.57)	1.29 ± 0.29 (0.54 - 2.38)	1.05 ± 0.41 (-0.050 - 2.03)	0.083	-0.25,2.35	(0.54 - 4.13) [0,3.63]	na	na
Vitamin E (mg/g dw)	0.0070 ± 0.0015 (0.0046 - 0.0080)	0.0081 ± 0.0015 (0.0050 - 0.014)	-0.0011 ± 0.0020 (-0.0059 - 0.0030)	0.617	-0.0073,0.0052	(0.0027 - 0.015) [0,0.021]	0.017-0.047	0.008-0.015

[a]ADF = acid detergent fiber; NDF = neutral detergent fiber; dw = dry wt.; fw = fresh wt; TIU = trypsin inhibitor units.
[b]The mean of four replicate values.
[c]S.E. = standard error of the mean.
[d]C.I. = confidence interval.
[e]Comm. = commercial. The range of sample values for commercial lines grown at the same E.U. sites in 1999.
[f]T. I. = tolerance interval, specified to contain 99% of the commercial line population, negative limits set to zero.
[g]Lit. = literature. For amino and fatty acids, Watson, 1982; for all other components, Watson, 1987; protein and fat second values from Jugenheimer, 1976.
[h]Hist. = historical. Range for control lines analyzed in Monsanto trials conducted between 1993 and 1995 (Sanders and Patzer, 1995; Sanders *et al.*, 1996a,b; 1997a,b,c).

Table 6. Combined Sites (FS-3, IT-4): Fiber and Proximate Content of Forage and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower, Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Historical[g] Range
Ash (% dw)	4.38 ± 0.75 (2.82 - 6.44)	4.44 ± 0.76 (3.35 - 5.80)	-0.064 ± 0.40 (-1.89 - 1.52)	0.875	-0.94,0.81	(2.43 - 9.64) [0,12.47]	2.9 - 5.1
Carbohydrates (% dw)	83.67 ± 1.52 (80.43 - 87.53)	83.65 ± 1.53 (80.64 - 85.52)	0.016 ± 1.12 (-3.57 - 2.50)	0.991	-14.26,14.30	(76.50 - 87.29) [75.55,91.37]	84.6 - 89.1
ADF (% dw)	23.53 ± 1.47 (19.27 - 26.13)	22.07 ± 1.50 (19.39 - 26.90)	1.46 ± 1.03 (-3.02 - 6.37)	0.180	-0.78,3.71	(17.54 - 38.31) [9.80,44.43]	21.4 - 29.2
NDF (% dw)	37.34 ± 1.63 (31.77 - 44.35)	37.75 ± 1.68 (34.85 - 41.86)	-0.41 ± 1.43 (-3.84 - 7.19)	0.785	-3.98,3.16	(27.93 - 54.75) [20.77,61.87]	39.9 - 46.6
Moisture (% fw)	67.53 ± 4.16 (61.60 - 75.20)	66.30 ± 4.17 (60.40 - 72.60)	1.23 ± 1.21 (-2.50 - 8.30)	0.495	-14.14,16.60	(56.50 - 80.40) [45.40,96.42]	68.7 - 73.5
Protein (% dw)	8.71 ± 1.12 (6.37 - 10.79)	8.86 ± 1.12 (7.03 - 10.96)	-0.15 ± 0.52 (-1.81 - 1.52)	0.825	-6.73,6.43	(4.98 - 11.56) [4.02,12.46]	4.8 - 8.4
Total fat (% dw)	3.24 ± 0.47 (2.06 - 4.49)	3.05 ± 0.47 (2.09 - 4.02)	0.19 ± 0.47 (-0.49 - 1.63)	0.758	-5.78,6.16	(1.42 - 4.57) [0.84,4.80]	1.4 - 2.1

[a]ADF = acid detergent fiber; NDF = neutral detergent fiber; dw = dry wt.; fw = fresh wt.
[b]The mean of eight replicate values.
[c]S.E. = standard error of the mean.
[d]C.I. = confidence interval.
[e]The range of sample values for commercial lines grown at the same E.U. sites in 1999.
[f]T. I. = tolerance interval, specified to contain 99% of the commercial line population, negative limits set to zero.
[g]Range for control lines analyzed in Monsanto Company trials conducted in 1994 and 1995 (Sanders *et al.*, 1996b; 1997a).

Table 7. Combined Sites (FS-3, IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower,Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Amino acids (% of total)								
Alanine	8.04 ± 0.029 (7.87 - 8.18)	7.95 ± 0.031 (7.88 - 8.05)	0.084 ± 0.033 (-0.039 - 0.22)	0.042	0.0040,0.16	(7.38 - 8.13) [7.20,8.35]	6.4-9.9	7.2-8.8
Arginine	4.00 ± 0.062 (3.74 - 4.27)	4.27 ± 0.067 (4.09 - 4.36)	-0.26 ± 0.082 (-0.55 - 0.032)	0.019	-0.46,-0.061	(3.77 - 4.98) [3.45,5.03]	2.9-5.9	3.5-5.0
Aspartic acid	6.45 ± 0.090 (6.27 - 6.96)	6.28 ± 0.092 (6.18 - 6.37)	0.17 ± 0.12 (-0.035 - 0.64)	0.302	-0.39,0.74	(6.02 - 7.51) [5.53,7.61]	5.8-7.2	6.3-7.5
Cystine	1.82 ± 0.062 (1.66 - 1.98)	1.92 ± 0.065 (1.61 - 2.09)	-0.10 ± 0.064 (-0.35 - 0.22)	0.143	-0.24,0.039	(1.68 - 2.51) [1.56,2.43]	1.2-1.6	1.8-2.7
Glutamic acid	19.93 ± 0.43 (18.98 - 20.62)	19.40 ± 0.43 (18.69 - 19.92)	0.54 ± 0.17 (-0.043 - 1.39)	0.009	0.16,0.91	(18.38 - 20.08) [18.03,20.76]	12.4-19.6	18.6-22.8
Glycine	3.44 ± 0.094 (3.23 - 3.64)	3.60 ± 0.095 (3.44 - 3.77)	-0.16 ± 0.057 (-0.31 - 0.044)	0.216	-0.88,0.56	(3.27 - 4.01) [3.06,4.15]	2.6-4.7	3.2-4.2
Histidine	2.65 ± 0.029 (2.56 - 2.74)	2.77 ± 0.030 (2.69 - 2.85)	-0.12 ± 0.027 (-0.22 - -0.027)	0.003	-0.18,-0.056	(2.58 - 3.15) [2.34,3.36]	2.0-2.8	2.8-3.4
Isoleucine	3.77 ± 0.048 (3.54 - 3.97)	3.76 ± 0.050 (3.61 - 3.85)	0.0047 ± 0.050 (-0.17 - 0.16)	0.927	-0.11,0.12	(3.34 - 3.85) [3.35,3.97]	2.6-4.0	3.2-4.3
Leucine	14.02 ± 0.28 (13.38 - 14.71)	13.69 ± 0.28 (13.27 - 13.96)	0.33 ± 0.22 (-0.40 - 0.76)	0.379	-2.51,3.17	(12.18 - 14.34) [11.73,14.76]	7.8-15.2	12.0-15.8

(continued over)

Table 7. Combined Sites (FS-3, IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower,Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Lysine	2.71 ± 0.14 (2.37 - 3.03)	2.83 ± 0.14 (2.56 - 3.20)	-0.12 ± 0.036 (-0.26 - 0.012)	0.015	-0.21,-0.031	(2.58 - 3.67) [2.22,3.68]	2.0-3.8	2.6-3.5
Methionine	1.77 ± 0.033 (1.66 - 1.85)	1.89 ± 0.035 (1.67 - 2.06)	-0.12 ± 0.049 (-0.32 - 0.12)	0.031	-0.22,-0.012	(1.49 - 2.32) [1.39,2.49]	1.0-2.1	1.3-2.6
Phenylalanine	5.28 ± 0.065 (5.13 - 5.46)	5.25 ± 0.065 (5.20 - 5.29)	0.034 ± 0.092 (-0.11 - 0.23)	0.748	-0.37,0.43	(4.85 - 5.54) [4.59,5.61]	2.9-5.7	4.9-6.1
Proline	9.33 ± 0.17 (8.89 - 9.71)	9.16 ± 0.17 (8.83 - 9.31)	0.17 ± 0.094 (-0.13 - 0.40)	0.317	-1.03,1.37	(8.74 - 9.91) [8.61,10.09]	6.6-10.3	8.7-10.1
Serine	4.84 ± 0.11 (4.47 - 5.17)	4.90 ± 0.11 (4.82 - 5.09)	-0.061 ± 0.15 (-0.45 - 0.25)	0.724	-0.73,0.60	(4.41 - 5.22) [4.36,5.19]	4.2-5.5	4.9-6.0
Threonine	3.31 ± 0.045 (3.14 - 3.57)	3.29 ± 0.047 (3.15 - 3.50)	0.018 ± 0.049 (-0.15 - 0.22)	0.763	-0.34,0.38	(3.24 - 3.66) [3.14,3.69]	2.9-3.9	3.3-4.2
Tryptophan	0.58 ± 0.028 (0.49 - 0.64)	0.62 ± 0.028 (0.57 - 0.69)	-0.036 ± 0.018 (-0.13 - 0.027)	0.090	-0.080,0.0075	(0.49 - 0.79) [0.45,0.76]	0.5-1.2	0.4-1.0
Tyrosine	3.24 ± 0.16 (2.11 - 3.65)	3.52 ± 0.18 (2.69 - 3.69)	-0.28 ± 0.23 (-1.53 - 0.37)	0.261	-0.82,0.26	(2.32 - 3.90) [3.00,4.03]	2.9-4.7	3.7-4.3
Valine	4.81 ± 0.085 (4.55 - 5.00)	4.90 ± 0.086 (4.74 - 5.04)	-0.094 ± 0.082 (-0.30 - 0.021)	0.455	-1.13,0.95	(4.65 - 5.29) [4.64,5.38]	2.1-5.2	4.2-5.3

(continued over)

Table 7. Combined Sites (FS-3, IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower,Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Fatty acids (% of total)								
16:0 palmitic acid	8.90 ± 0.24 (8.47 - 9.36)	9.00 ± 0.24 (8.89 - 9.13)	-0.11 ± 0.31 (-0.66 - 0.32)	0.787	-4.03,3.82	(9.12 - 12.62) [7.35,14.72]	7-19	9.9-12.0
18:0 stearic acid	1.73 ± 0.091 (1.59 - 1.88)	1.74 ± 0.091 (1.67 - 1.81)	-0.010 ± 0.061 (-0.083 - 0.10)	0.892	-0.78,0.76	(1.19 - 2.02) [1.02,2.27]	1-3	1.4-2.2
18:1 oleic acid	23.80 ± 0.68 (22.82 - 24.95)	24.20 ± 0.68 (23.52 - 25.56)	-0.40 ± 0.39 (-1.16 - 1.22)	0.494	-5.40,4.60	(20.21 - 34.64) [12.65,39.86]	20-46	20.6-27.5
18:2 linoleic acid	63.73 ± 1.05 (61.94 - 65.25)	63.15 ± 1.05 (61.63 - 64.04)	0.58 ± 0.76 (-1.65 - 1.66)	0.582	-9.03,10.19	(49.72 - 65.98) [44.59,73.50]	35-70	55.9-66.1
18:3 linolenic acid	1.02 ± 0.020 (0.97 - 1.05)	1.09 ± 0.020 (1.05 - 1.12)	-0.065 ± 0.023 (-0.13 - -0.012)	0.215	-0.36,0.23	(0.71 - 1.50) [0.54,1.72]	0.8-2	0.8-1.1
20:0 arachidic acid	0.36 ± 0.012 (0.34 - 0.39)	0.35 ± 0.012 (0.33 - 0.37)	0.010 ± 0.0024 (0.0010 - 0.019)	0.004	0.0043,0.016	(0.31 - 0.74) [0.17,0.64]	0.1-2	0.3-0.5
20:1 eicosenoic acid	0.30 ± 0.012 (0.28 - 0.34)	0.29 ± 0.012 (0.28 - 0.31)	0.013 ± 0.0077 (-0.0034 - 0.042)	0.339	-0.084,0.11	(0.26 - 0.40) [0.21,0.42]	na	0.2-0.3
22:0 behenic acid	0.16 ± 0.015 (0.12 - 0.20)	0.18 ± 0.016 (0.15 - 0.19)	-0.017 ± 0.0091 (-0.034 - 0.0085)	0.318	-0.13,0.099	(0.073 - 0.22) [0.093,0.24]	na	0.1-0.3

(continued over)

Table 7. Combined Sites (FS-3, IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower,Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Minerals								
Calcium (% dw)	0.0053 ± 0.00012 (0.0050 - 0.0058)	0.0053 ± 0.00013 (0.0050 - 0.0058)	-0.00005 ± 0.00015 (-0.00059 - 0.00059)	0.764	-0.00037,0.00028	(0.0039 - 0.0076) [0.0028,0.0082]	0.01-0.1	0.003-0.006
Copper (mg/kg dw)	1.89 ± 0.032 (1.77 - 1.99)	1.83 ± 0.034 (1.69 - 1.97)	0.054 ± 0.046 (-0.15 - 0.27)	0.265	-0.046,0.15	(1.16 - 2.78) [0.45,3.16]	0.9-10	na
Iron (mg/kg dw)	22.73 ± 3.07 (17.43 - 26.91)	21.81 ± 3.08 (18.52 - 25.87)	0.92 ± 0.50 (-1.32 - 2.63)	0.105	-0.25,2.10	(15.42 - 29.34) [10.60,33.63]	1-100	na
Magnesium (% dw)	0.12 ± 0.0076 (0.096 - 0.13)	0.11 ± 0.0076 (0.10 - 0.12)	0.0062 ± 0.0033 (-0.0063 - 0.013)	0.308	-0.035,0.048	(0.089 - 0.15) [0.079,0.16]	0.09-1.0	na
Manganese (mg/kg dw)	6.73 ± 0.83 (5.18 - 7.90)	6.42 ± 0.83 (5.63 - 7.32)	0.31 ± 0.26 (-0.59 - 0.92)	0.440	-2.96,3.58	(3.86 - 10.47) [2.50,12.03]	0.7-54	na
Phosphorus (% dw)	0.36 ± 0.016 (0.31 - 0.39)	0.35 ± 0.016 (0.32 - 0.37)	0.010 ± 0.0097 (-0.033 - 0.035)	0.479	-0.11,0.13	(0.27 - 0.39) [0.27,0.42]	0.26-0.75	0.288-0.363
Potassium (% dw)	0.36 ± 0.0046 (0.34 - 0.38)	0.38 ± 0.0049 (0.36 - 0.39)	-0.021 ± 0.0068 (-0.047 - 0.010)	0.008	-0.035,-0.0062	(0.32 - 0.45) [0.31,0.45]	0.32-0.72	na
Zinc (mg/kg dw)	23.78 ± 5.63 (15.95 - 31.45)	23.21 ± 5.63 (17.87 - 29.88)	0.56 ± 0.76 (-1.93 - 1.73)	0.594	-9.11,10.24	(13.51 - 27.98) [9.89,31.52]	12-30	na

(continued over)

Table 7. Combined Sites (FS-3, IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower,Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Fiber and Proximates								
Ash (% dw)	1.38 ± 0.046 (1.23 - 1.65)	1.34 ± 0.049 (1.25 - 1.50)	0.042 ± 0.067 (-0.25 - 0.40)	0.543	-0.10,0.19	(1.02 - 1.94) [0.77,2.22]	1.1-3.9	1.2-1.8
Carbohydrates (% dw)	82.39 ± 1.31 (80.49 - 84.57)	83.73 ± 1.31 (81.93 - 84.92)	-1.34 ± 0.48 (-2.66 - -0.21)	0.218	-7.39,4.72	(82.18 - 88.14) [79.38,88.91]	na	81.7-86.3
ADF (% dw)	3.21 ± 0.21 (2.63 - 3.87)	3.03 ± 0.21 (2.30 - 3.68)	0.18 ± 0.11 (-0.24 - 0.59)	0.161	-0.095,0.45	(2.46 - 6.33) [1.96,4.71]	3.3 - 4.3	3.1 - 5.3
NDF (% dw)	10.08 ± 0.69 (8.50 - 12.00)	10.57 ± 0.70 (9.35 - 11.63)	-0.49 ± 0.52 (-2.07 - 2.12)	0.362	-1.63,0.64	(8.45 - 14.75) [7.26,14.64]	8.3-11.9	9.6 - 15.3
Moisture (% fw)	7.62 ± 0.10 (7.34 - 7.82)	7.81 ± 0.11 (7.55 - 8.28)	-0.18 ± 0.10 (-0.68 - 0.16)	0.101	-0.41,0.042	(7.43 - 9.94) [7.06,9.53]	7-23	9.4 - 15.8
Total fat (% dw)	4.16 ± 0.078 (3.87 - 4.48)	3.60 ± 0.083 (3.24 - 3.84)	0.57 ± 0.092 (0.20 - 0.82)	<0.001	0.34,0.79	(2.57 - 4.95) [1.55,5.75]	3.1-5.7, 2.9-6.1	2.4-4.2
Protein (% dw)	12.07 ± 1.34 (10.23 - 13.92)	11.34 ± 1.34 (10.13 - 13.05)	0.72 ± 0.50 (-0.071 - 1.75)	0.385	-5.64,7.09	(7.77 - 12.99) [6.84,14.57]	6.0 - 12.0 6.0 - 12.0	9.0 - 13.6

(continued over)

Table 7. Combined Sites (FS-3, IT-4): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain and Statistical Summary

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Difference (NK603 minus Control) Mean ± S.E.[c] (Range)	p-value	95% C.I.[d] (Lower,Upper)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Miscellaneous								
Phytic Acid (% dw)	0.79 ± 0.036 (0.51 - 0.89)	0.70 ± 0.038 (0.55 - 0.77)	0.087 ± 0.052 (-0.26 - 0.20)	0.120	-0.026,0.20	(0.48 - 1.12) [0.32,1.18]	to 0.9%	na
Trypsin Inhibitor (TIU/mg dw)	1.56 ± 0.56 (0.54 - 2.57)	1.15 ± 0.57 (0.54 - 2.38)	0.41 ± 0.64 (-0.52 - 2.03)	0.635	-7.74,8.57	(0.54 - 4.13) [0,3.63]	na	na
Vitamin E (mg/g dw)	0.0062 ± 0.0011 (0.0046 - 0.0080)	0.0070 ± 0.0011 (0.0050 - 0.014)	-0.00083 ± 0.0010 (-0.0059 - 0.0030)	0.433	-0.0032,0.0015	(0.0027 - 0.015) [0,0.021]	0.017-0.047	0.008-0.015

[a]ADF = acid detergent fiber; NDF = neutral detergent fiber; dw = dry wt.; fw = fresh wt; TIU = trypsin inhibitor units.
[b]The mean of eight replicate values.
[c]S.E. = standard error of the mean.
[d]C.I. = confidence interval.
[e]Comm. = commercial. The range of sample values for commercial lines grown at the same E.U. sites in 1999.
[f]T.I. = tolerance interval, specified to contain 99% of the commercial line population, negative limits set to zero.
[g]Lit. = literature. For amino and fatty acids, Watson, 1982; for all other components, Watson, 1987; protein and fat second values from Jugenheimer, 1976.
[h]Hist. = historical. Range for control lines analyzed in Monsanto trials conducted between 1993 and 1995 (Sanders and Patzer, 1995; Sanders *et al.*, 1996a,b; 1997a,b,c).

Table 8. Treated/Untreated Block Trial (Site FN-1): Fiber and Proximate Content of Forage

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Historical[g] Range
Ash (% dw)	5.20 ± 0.23 (4.61 - 5.70)	6.54 ± 0.51 (5.69 - 8.01)	(2.43 - 9.64) [0,12.47]	2.9 - 5.1
Carbohydrates (% dw)	84.68 ± 0.51 (83.29 - 85.55)	82.70 ± 1.98 (77.65 - 87.13)	(76.50 - 87.29) [75.55,91.37]	84.6 - 89.1
ADF (% dw)	29.55 ± 0.69 (28.14 - 31.23)	28.17 ± 0.87 (26.32 - 30.35)	(17.54 - 38.31) [9.80,44.43]	21.4 - 29.2
NDF (% dw)	44.95 ± 1.57 (40.95 - 48.36)	42.43 ± 1.45 (39.75 - 46.46)	(27.93 - 54.75) [20.77,61.87]	39.9 - 46.6
Moisture (% fw)	78.23 ± 0.83 (75.80 - 79.60)	76.38 ± 0.42 (75.40 - 77.40)	(56.50 - 80.40) [45.40,96.42]	68.7 - 73.5
Protein (% dw)	7.94 ± 0.49 (6.62 - 8.97)	8.17 ± 1.17 (5.61 - 11.26)	(4.98 - 11.56) [4.02,12.46]	4.8 - 8.4
Total fat (% dw)	2.19 ± 0.47 (1.42 - 3.54)	2.59 ± 0.46 (1.58 - 3.61)	(1.42 - 4.57) [0.84,4.80]	1.4 - 2.1

[a]ADF = acid detergent fiber; NDF = neutral detergent fiber; dw = dry wt.; fw = fresh wt.
[b]The mean of four replicate values.
[c]S.E. = standard error of the mean.
[d]C.I. = confidence interval.
[e]The range of sample values for commercial lines grown at the same E.U. sites in 1999.
[f]T. I. = tolerance interval, specified to contain 99% of the commercial line population, negative limits set to zero.
[g]Range for control lines analyzed in Monsanto Company trials conducted in 1994 and 1995 (Sanders *et al.*, 1996b; 1997a).

Table 9. Treated/Untreated Block Trial (Site FN-1): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Amino acids (% of total)					
Alanine	8.01 ± 0.052 (7.88 - 8.11)	7.88 ± 0.039 (7.77 - 7.95)	(7.38 - 8.13) [7.20,8.35]	6.4-9.9	7.2-8.8
Arginine	3.64 ± 0.087 (3.47 - 3.88)	3.85 ± 0.14 (3.64 - 4.24)	(3.77 - 4.98) [3.45,5.03]	2.9-5.9	3.5-5.0
Aspartic acid	6.70 ± 0.093 (6.50 - 6.93)	6.84 ± 0.11 (6.56 - 7.08)	(6.02 - 7.51) [5.53,7.61]	5.8-7.2	6.3-7.5
Cystine	1.76 ± 0.060 (1.59 - 1.88)	1.82 ± 0.052 (1.69 - 1.95)	(1.68 - 2.51) [1.56,2.43]	1.2-1.6	1.8-2.7
Glutamic acid	20.31 ± 0.098 (20.02 - 20.43)	20.10 ± 0.12 (19.81 - 20.40)	(18.38 - 20.08) [18.03,20.76]	12.4-19.6	18.6-22.8
Glycine	3.16 ± 0.058 (3.07 - 3.31)	3.27 ± 0.052 (3.13 - 3.36)	(3.27 - 4.01) [3.06,4.15]	2.6-4.7	3.2-4.2
Histidine	2.52 ± 0.029 (2.46 - 2.60)	2.60 ± 0.025 (2.54 - 2.65)	(2.58 - 3.15) [2.34,3.36]	2.0-2.8	2.8-3.4
Isoleucine	3.79 ± 0.041 (3.68 - 3.88)	3.83 ± 0.016 (3.80 - 3.87)	(3.34 - 3.85) [3.35,3.97]	2.6-4.0	3.2-4.3
Leucine	14.34 ± 0.15 (14.01 - 14.60)	13.98 ± 0.16 (13.60 - 14.37)	(12.18 - 14.34) [11.73,14.76]	7.8-15.2	12.0-15.8

(Continued over)

Table 9. Treated/Untreated Block Trial (Site FN-1): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Lysine	2.60 ± 0.12 (2.35 - 2.91)	2.69 ± 0.088 (2.43 - 2.82)	(2.58 - 3.67) [2.22,3.68]	2.0-3.8	2.6-3.5
Methionine	1.79 ± 0.038 (1.68 - 1.85)	1.86 ± 0.054 (1.75 - 2.00)	(1.49 - 2.32) [1.39,2.49]	1.0-2.1	1.3-2.6
Phenylalanine	5.31 ± 0.034 (5.21 - 5.36)	5.22 ± 0.029 (5.14 - 5.28)	(4.85 - 5.54) [4.59,5.61]	2.9-5.7	4.9-6.1
Proline	9.02 ± 0.074 (8.88 - 9.16)	9.08 ± 0.11 (8.88 - 9.40)	(8.74 - 9.91) [8.61,10.09]	6.6-10.3	8.7-10.1
Serine	4.81 ± 0.11 (4.61 - 5.14)	4.69 ± 0.023 (4.62 - 4.72)	(4.41 - 5.22) [4.36,5.19]	4.2-5.5	4.9-6.0
Threonine	3.23 ± 0.049 (3.10 - 3.34)	3.20 ± 0.032 (3.12 - 3.27)	(3.24 - 3.66) [3.14,3.69]	2.9-3.9	3.3-4.2
Tryptophan	0.50 ± 0.010 (0.48 - 0.53)	0.56 ± 0.024 (0.51 - 0.60)	(0.49 - 0.79) [0.45,0.76]	0.5-1.2	0.4-1.0
Tyrosine	3.71 ± 0.024 (3.65 - 3.76)	3.68 ± 0.018 (3.64 - 3.73)	(2.32 - 3.90) [3.00,4.03]	2.9-4.7	3.7-4.3
Valine	4.82 ± 0.058 (4.65 - 4.91)	4.87 ± 0.028 (4.79 - 4.92)	(4.65 - 5.29) [4.64,5.38]	2.1-5.2	4.2-5.3

(Continued over)

Table 9. Treated/Untreated Block Trial (Site FN-1): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Fatty acids (% of total)					
16:0 palmitic acid	8.50 ± 0.062 (8.38 - 8.67)	8.63 ± 0.046 (8.57 - 8.77)	(9.12 - 12.62) [7.35,14.72]	7-19	9.9-12.0
18:0 stearic acid	1.43 ± 0.053 (1.28 - 1.52)	1.48 ± 0.015 (1.45 - 1.52)	(1.19 - 2.02) [1.02,2.27]	1-3	1.4-2.2
18:1 oleic acid	20.88 ± 0.12 (20.56 - 21.10)	21.22 ± 0.10 (20.97 - 21.46)	(20.21 - 34.64) [12.65,39.86]	20-46	20.6-27.5
18:2 linoleic acid	67.38 ± 0.23 (67.00 - 68.02)	66.80 ± 0.14 (66.40 - 67.04)	(49.72 - 65.98) [44.59,73.50]	35-70	55.9-66.1
18:3 linolenic acid	1.03 ± 0.0093 (1.01 - 1.05)	1.06 ± 0.015 (1.02 - 1.09)	(0.71 - 1.50) [0.54,1.72]	0.8-2	0.8-1.1
20:0 arachidic acid	0.37 ± 0.0015 (0.36 - 0.37)	0.36 ± 0.0027 (0.36 - 0.37)	(0.31 - 0.74) [0.17,0.64]	0.1-2	0.3-0.5
20:1 eicosenoic acid	0.30 ± 0.0033 (0.29 - 0.31)	0.31 ± 0.0023 (0.30 - 0.31)	(0.26 - 0.40) [0.21,0.42]	na	0.2-0.3
22:0 behenic acid	0.12 ± 0.023 (0.052 - 0.15)	0.15 ± 0.0048 (0.14 - 0.16)	(0.073 - 0.22) [0.093,0.24]	na	0.1-0.3

(continued over)

Table 9. Treated/Untreated Block Trial (Site FN-1): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Minerals					
Calcium (% dw)	0.0077 ± 0.00006 (0.0076 - 0.0079)	0.0076 ± 0.00017 (0.0072 - 0.0079)	(0.0039 - 0.0076) [0.0028,0.0082]	0.01-0.1	0.003-0.006
Copper (mg/kg dw)	1.75 ± 0.052 (1.66 - 1.90)	1.72 ± 0.032 (1.66 - 1.78)	(1.16 - 2.78) [0.45,3.16]	0.9-10	na
Iron (mg/kg dw)	19.91 ± 0.49 (18.96 - 21.21)	20.65 ± 1.07 (17.99 - 23.12)	(15.42 - 29.34) [10.60,33.63]	1-100	na
Magnesium (% dw)	0.12 ± 0.0017 (0.12 - 0.13)	0.13 ± 0.0043 (0.11 - 0.13)	(0.089 - 0.15) [0.079,0.16]	0.09-1.0	na
Manganese (mg/kg dw)	7.81 ± 0.22 (7.36 - 8.25)	8.26 ± 0.31 (7.35 - 8.69)	(3.86 - 10.47) [2.50,12.03]	0.7-54	na
Phosphorus (% dw)	0.38 ± 0.0023 (0.37 - 0.38)	0.38 ± 0.012 (0.35 - 0.40)	(0.27 - 0.39) [0.27,0.42]	0.26-0.75	0.288-0.363
Potassium (% dw)	0.43 ± 0.0050 (0.42 - 0.44)	0.46 ± 0.016 (0.41 - 0.49)	(0.32 - 0.45) [0.31,0.45]	0.32-0.72	na
Zinc (mg/kg dw)	24.23 ± 0.23 (23.81 - 24.69)	24.74 ± 0.84 (22.68 - 26.43)	(13.51 - 27.98) [9.89,31.52]	12-30	na

(continued over)

Table 9. Treated/Untreated Block Trial (Site FN-1): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Fiber/ Proximates					
Ash (% dw)	1.80 ± 0.021 (1.76 - 1.86)	1.85 ± 0.043 (1.80 - 1.98)	(1.02 - 1.94) [0.77,2.22]	1.1-3.9	1.2-1.8
Carbohydrates (% dw)	79.84 ± 0.39 (78.90 - 80.79)	80.54 ± 0.29 (79.98 - 81.28)	(82.18 - 88.14) [79.38,88.91]	na	81.7-86.3
ADF (% dw)	3.37 ± 0.087 (3.18 - 3.60)	3.44 ± 0.13 (3.22 - 3.82)	(2.46 - 6.33) [1.96,4.71]	3.3 - 4.3	3.1 - 5.3
NDF (% dw)	10.89 ± 0.39 (9.83 - 11.67)	11.95 ± 0.22 (11.42 - 12.48)	(8.45 - 14.75) [7.26,14.64]	8.3-11.9	9.6 - 15.3
Moisture (% fw)	8.16 ± 0.074 (8.02 - 8.34)	8.13 ± 0.10 (7.87 - 8.33)	(7.43 - 9.94) [7.06,9.53]	7-23	9.4 - 15.8
Total fat (% dw)	4.28 ± 0.068 (4.11 - 4.44)	3.78 ± 0.068 (3.60 - 3.93)	(2.57 - 4.95) [1.55,5.75]	3.1-5.7, 2.9-6.1	2.4-4.2
Protein (% dw)	14.07 ± 0.34 (13.29 - 14.90)	13.82 ± 0.28 (13.08 - 14.29)	(7.77 - 12.99) [6.84,14.57]	6.0 - 12.0, 9.7 - 16.1	9.0 - 13.6

(continued over)

Table 9. Treated/Untreated Block Trial (Site FN-1): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Miscellaneous					
Phytic Acid (% dw)	0.95 ± 0.029 (0.90 - 1.01)	1.03 ± 0.068 (0.83 - 1.12)	(0.48 - 1.12) [0.32,1.18]	to 0.9%	na
Trypsin Inhibitor (TIU/mg dw)	2.35 ± 0.068 (2.16 - 2.47)	2.01 ± 0.19 (1.71 - 2.56)	(0.54 - 4.13) [0,3.63]	na	na
Vitamin E (mg/g dw)	0.0060 ± 0.00018 (0.0055 - 0.0064)	0.0061 ± 0.00015 (0.0057 - 0.0064)	(0.0027 - 0.015) [0,0.021]	0.017-0.047	0.008-0.015

[a]ADF = acid detergent fiber; NDF = neutral detergent fiber; dw = dry wt.; fw = fresh wt; TIU = trypsin inhibitor units.
[b]The mean of four replicate values.
[c]S.E. = standard error of the mean.
[d]C.I. = confidence interval.
[e]Comm. = commercial. The range of sample values for commercial lines grown at the same E.U. sites in 1999.
[f]T.I. = tolerance interval, specified to contain 99% of the commercial line population, negative limits set to zero.
[g]Lit. = literature. For amino and fatty acids, Watson, 1982; for all other components, Watson, 1987; protein and fat second values from Jugenheimer, 1976.
[h]Hist. = historical. Range for control lines analyzed in Monsanto trials conducted between 1993 and 1995 (Sanders and Patzer, 1995; Sanders *et al.*, 1996a,b; 1997a,b,c).

Table 10. Treated/Untreated Block Trial (Site FN-2): Fiber and Proximate Content of Forage

Component[a]	MON NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Historical[g] Range
Fiber/ Proximates				
Ash (% dw)	5.37 ± 0.12 (5.13 - 5.62)	5.73 ± 0.43 (4.88 - 6.89)	(2.43 - 9.64) [0,12.47]	2.9 - 5.1
Carbohydrates (% dw)	83.07 ± 0.44 (82.25 - 84.31)	82.48 ± 0.22 (81.85 - 82.80)	(76.50 - 87.29) [75.55,91.37]	84.6 - 89.1
ADF (% dw)	25.37 ± 1.21 (22.19 - 27.90)	26.79 ± 1.30 (22.99 - 28.78)	(17.54 - 38.31) [9.80,44.43]	21.4 - 29.2
NDF (% dw)	42.36 ± 1.93 (36.78 - 45.62)	37.94 ± 1.43 (33.90 - 40.47)	(27.93 - 54.75) [20.77,61.87]	39.9 - 46.6
Moisture (% fw)	78.40 ± 0.48 (77.60 - 79.80)	79.38 ± 0.73 (77.80 - 81.30)	(56.50 - 80.40) [45.40,96.42]	68.7 - 73.5
Protein (% dw)	8.58 ± 0.34 (7.82 - 9.18)	9.49 ± 0.40 (8.60 - 10.19)	(4.98 - 11.56) [4.02,12.46]	4.8 - 8.4
Total fat (% dw)	2.98 ± 0.25 (2.46 - 3.46)	2.30 ± 0.34 (1.70 - 3.28)	(1.42 - 4.57) [0.84,4.80]	1.4 - 2.1

[a]ADF = acid detergent fiber; NDF = neutral detergent fiber; dw = dry wt.; fw = fresh wt.
[b]The mean of four replicate values.
[c]S.E. = standard error of the mean.
[d]C.I. = confidence interval.
[e]The range of sample values for commercial lines grown at the same E.U. sites in 1999.
[f]T.I. = tolerance interval, specified to contain 99% of the commercial line population, negative limits set to zero.
[g]Range for control lines analyzed in Monsanto Company trials conducted in 1994 and 1995 (Sanders *et al.*, 1996b; 1997a).

Table 11. Treated/Untreated Block Trial (Site FN-2): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Amino acids (% of total)					
Alanine	8.06 ± 0.050 (7.93 - 8.16)	7.99 ± 0.040 (7.88 - 8.06)	(7.38 - 8.13) [7.20,8.35]	6.4-9.9	7.2-8.8
Arginine	3.64 ± 0.061 (3.49 - 3.76)	3.74 ± 0.068 (3.66 - 3.94)	(3.77 - 4.98) [3.45,5.03]	2.9-5.9	3.5-5.0
Aspartic acid	6.97 ± 0.019 (6.94 - 7.02)	6.79 ± 0.066 (6.61 - 6.92)	(6.02 - 7.51) [5.53,7.61]	5.8-7.2	6.3-7.5
Cystine	1.57 ± 0.093 (1.31 - 1.74)	1.72 ± 0.013 (1.69 - 1.75)	(1.68 - 2.51) [1.56,2.43]	1.2-1.6	1.8-2.7
Glutamic acid	20.42 ± 0.092 (20.15 - 20.56)	20.29 ± 0.11 (19.99 - 20.54)	(18.38 - 20.08) [18.03,20.76]	12.4-19.6	18.6-22.8
Glycine	3.07 ± 0.017 (3.03 - 3.11)	3.15 ± 0.056 (3.04 - 3.30)	(3.27 - 4.01) [3.06,4.15]	2.6-4.7	3.2-4.2
Histidine	2.45 ± 0.012 (2.43 - 2.48)	2.52 ± 0.021 (2.48 - 2.57)	(2.58 - 3.15) [2.34,3.36]	2.0-2.8	2.8-3.4
Isoleucine	3.91 ± 0.055 (3.79 - 4.05)	3.86 ± 0.071 (3.65 - 3.97)	(3.34 - 3.85) [3.35,3.97]	2.6-4.0	3.2-4.3
Leucine	14.43 ± 0.049 (14.34 - 14.55)	14.26 ± 0.10 (13.97 - 14.45)	(12.18 - 14.34) [11.73,14.76]	7.8-15.2	12.0-15.8

(continued over)

Table 11. Treated/Untreated Block Trial (Site FN-2): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Lysine	2.53 ± 0.051 (2.39 - 2.64)	2.59 ± 0.047 (2.48 - 2.70)	(2.58 - 3.67) [2.22,3.68]	2.0-3.8	2.6-3.5
Methionine	1.82 ± 0.078 (1.62 - 2.00)	1.82 ± 0.011 (1.80 - 1.85)	(1.49 - 2.32) [1.39,2.49]	1.0-2.1	1.3-2.6
Phenylalanine	5.32 ± 0.0090 (5.30 - 5.34)	5.27 ± 0.025 (5.21 - 5.33)	(4.85 - 5.54) [4.59,5.61]	2.9-5.7	4.9-6.1
Proline	8.98 ± 0.10 (8.75 - 9.18)	9.18 ± 0.060 (9.10 - 9.35)	(8.74 - 9.91) [8.61,10.09]	6.6-10.3	8.7-10.1
Serine	4.64 ± 0.12 (4.43 - 4.98)	4.64 ± 0.11 (4.41 - 4.93)	(4.41 - 5.22) [4.36,5.19]	4.2-5.5	4.9-6.0
Threonine	3.18 ± 0.031 (3.12 - 3.27)	3.22 ± 0.082 (3.11 - 3.46)	(3.24 - 3.66) [3.14,3.69]	2.9-3.9	3.3-4.2
Tryptophan	0.58 ± 0.018 (0.55 - 0.62)	0.53 ± 0.0044 (0.52 - 0.54)	(0.49 - 0.79) [0.45,0.76]	0.5-1.2	0.4-1.0
Tyrosine	3.50 ± 0.16 (3.01 - 3.71)	3.60 ± 0.11 (3.27 - 3.73)	(2.32 - 3.90) [3.00,4.03]	2.9-4.7	3.7-4.3
Valine	4.91 ± 0.045 (4.81 - 5.03)	4.84 ± 0.056 (4.67 - 4.90)	(4.65 - 5.29) [4.64,5.38]	2.1-5.2	4.2-5.3

(Continued over)

Table 11. Treated/Untreated Block Trial (Site FN-2): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Fatty acids (% of total)					
16:0 palmitic acid	8.38 ± 0.067 (8.22 - 8.49)	8.36 ± 0.045 (8.24 - 8.44)	(9.12 - 12.62) [7.35,14.72]	7-19	9.9-12.0
18:0 stearic acid	1.36 ± 0.013 (1.32 - 1.38)	1.34 ± 0.013 (1.32 - 1.37)	(1.19 - 2.02) [1.02,2.27]	1-3	1.4-2.2
18:1 oleic acid	20.83 ± 0.13 (20.44 - 21.04)	21.05 ± 0.23 (20.53 - 21.56)	(20.21 - 34.64) [12.65,39.86]	20-46	20.6-27.5
18:2 linoleic acid	67.54 ± 0.20 (67.15 - 68.03)	67.38 ± 0.19 (66.87 - 67.68)	(49.72 - 65.98) [44.59,73.50]	35-70	55.9-66.1
18:3 linolenic acid	1.06 ± 0.013 (1.03 - 1.09)	1.05 ± 0.038 (1.01 - 1.17)	(0.71 - 1.50) [0.54,1.72]	0.8-2	0.8-1.1
20:0 arachidic acid	0.38 ± 0.0039 (0.37 - 0.39)	0.36 ± 0.0053 (0.35 - 0.38)	(0.31 - 0.74) [0.17,0.64]	0.1-2	0.3-0.5
20:1 eicosenoic acid	0.31 ± 0.0019 (0.30 - 0.31)	0.31 ± 0.0030 (0.30 - 0.32)	(0.26 - 0.40) [0.21,0.42]	na	0.2-0.3
22:0 behenic acid	0.15 ± 0.0057 (0.14 - 0.16)	0.15 ± 0.0067 (0.14 - 0.17)	(0.073 - 0.22) [0.093,0.24]	na	0.1-0.3

(continued over)

Table 11. Treated/Untreated Block Trial (Site FN-2): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Minerals					
Calcium (% dw)	0.0094 ± 0.00038 (0.0085 - 0.010)	0.0098 ± 0.00068 (0.0080 - 0.011)	(0.0039 - 0.0076) [0.0028,0.0082]	0.01-0.1	0.003-0.006
Copper (mg/kg dw)	1.90 ± 0.060 (1.75 - 2.05)	1.80 ± 0.064 (1.64 - 1.92)	(1.16 - 2.78) [0.45,3.16]	0.9-10	na
Iron (mg/kg dw)	23.31 ± 0.39 (22.37 - 24.24)	23.24 ± 0.84 (20.91 - 24.90)	(15.42 - 29.34) [10.60,33.63]	1-100	na
Magnesium (% dw)	0.15 ± 0.0036 (0.14 - 0.15)	0.13 ± 0.0018 (0.12 - 0.13)	(0.089 - 0.15) [0.079,0.16]	0.09-1.0	na
Manganese (mg/kg dw)	9.70 ± 0.51 (8.33 - 10.82)	9.25 ± 0.41 (8.76 - 10.46)	(3.86 - 10.47) [2.50,12.03]	0.7-54	na
Phosphorus (% dw)	0.44 ± 0.0097 (0.41 - 0.45)	0.39 ± 0.0050 (0.38 - 0.41)	(0.27 - 0.39) [0.27,0.42]	0.26-0.75	0.288-0.363
Potassium (% dw)	0.54 ± 0.021 (0.48 - 0.57)	0.51 ± 0.013 (0.47 - 0.53)	(0.32 - 0.45) [0.31,0.45]	0.32-0.72	na
Zinc (mg/kg dw)	26.26 ± 0.81 (23.88 - 27.52)	26.23 ± 0.82 (24.13 - 27.74)	(13.51 - 27.98) [9.89,31.52]	12-30	na

(continued over)

Table 11. Treated/Untreated Block Trial (Site FN-2): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Fiber/Proximates					
Ash (% dw)	2.21 ± 0.066 (2.03 - 2.35)	2.02 ± 0.074 (1.83 - 2.16)	(1.02 - 1.94) [0.77,2.22]	1.1-3.9	1.2-1.8
Carbohydrates (% dw)	77.29 ± 0.32 (76.50 - 78.07)	78.64 ± 0.48 (77.40 - 79.70)	(82.18 - 88.14) [79.38,88.91]	na	81.7-86.3
ADF (% dw)	4.13 ± 0.47 (3.47 - 5.52)	4.52 ± 0.17 (4.23 - 4.96)	(2.46 - 6.33) [1.96,4.71]	3.3 - 4.3	3.1 - 5.3
NDF (% dw)	12.51 ± 0.55 (11.35 - 13.53)	16.25 ± 0.94 (14.69 - 18.53)	(8.45 - 14.75) [7.26,14.64]	8.3-11.9	9.6 - 15.3
Moisture (% fw)	7.64 ± 0.15 (7.44 - 8.07)	8.02 ± 0.16 (7.72 - 8.43)	(7.43 - 9.94) [7.06,9.53]	7-23	9.4 - 15.8
Total fat (% dw)	3.82 ± 0.048 (3.73 - 3.96)	3.61 ± 0.019 (3.57 - 3.65)	(2.57 - 4.95) [1.55,5.75]	3.1-5.7, 2.9-6.1	2.4-4.2
Protein (% dw)	16.67 ± 0.22 (16.10 - 17.19)	15.74 ± 0.46 (14.75 - 16.87)	(7.77 - 12.99) [6.84,14.57]	6.0 - 12.0, 9.7 -16.1	9.0 - 13.6

(continued over)

Table 11. Treated/Untreated Block Trial (Site FN-2): Amino Acid, Fatty Acid, Fiber, Mineral, Proximate, Phytic Acid, Trypsin Inhibitor and Vitamin E Content of Grain

Component[a]	NK603 Mean[b] ± S.E.[c] (Range)	Control Mean[b] ± S.E.[c] (Range)	Comm. Range[e] [95% T.I.[f] Lower, Upper]	Lit.[g] Range	Hist.[h] Range
Miscellaneous					
Phytic Acid (% dw)	1.01 ± 0.048 (0.87 - 1.07)	0.88 ± 0.075 (0.72 - 1.01)	(0.48 - 1.12) [0.32,1.18]	to 0.9%	na
Trypsin Inhibitor (TIU/mg dw)	0.83 ± 0.29 (0.54 - 1.69)	1.27 ± 0.070 (1.09 - 1.40)	(0.54 - 4.13) [0,3.63]	na	na
Vitamin E (mg/g dw)	0.0052 ± 0.00042 (0.0045 - 0.0064)	0.0056 ± 0.00025 (0.0050 - 0.0062)	(0.0027 - 0.015) [0,0.021]	0.017-0.047	0.008-0.015

[a]ADF = acid detergent fiber; NDF = neutral detergent fiber; dw = dry wt.; fw = fresh wt; TIU = trypsin inhibitor units.
[b]The mean of four replicate values.
[c]S.E. = standard error of the mean.
[d]C.I. = confidence interval.
[e]Comm. = commercial. The range of sample values for commercial lines grown at the same E.U. field sites in 1999.
[f]T.I. = tolerance interval, specified to contain 99% of the commercial line population, negative limits set to zero.
[g]Lit. = literature. For amino and fatty acids, Watson, 1982; for all other components, Watson, 1987; protein and fat second values from Jugenheimer, 1976.
[h]Hist. = historical. Range for control lines analyzed in Monsanto trials conducted between 1993 and 1995 (Sanders and Patzer, 1995; Sanders *et al.*, 1996a,b; 1997a,b,c).

APPENDIX 1

Compositional Analyses of Tissues Collected from Roundup® Tolerant Corn Line NK603 Grown in 1999 E.U. Field Trials

Study Protocol and Amendments

The following 12 pages are the Study Protocol and all amendments.

Monsanto Study #: 99-01-46-52
Covance Study #: 6103-252

Study Title: Compositional Analyses of Tissues Collected from Roundup® Tolerant Corn Line NK603 Grown in 1999 E.U. Field Trials

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Approved By:

April 10, 2000
Date

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Testing Facility Management Representative
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William P. Ridley

April 13, 2000
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William P. Ridley
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Ravinder S Sidhu

April 3, 2000
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April 3, 2000
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Co-Director, Product Safety Technology Center
Monsanto Company
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Reviewed By:

4-11-00
Date

Matthew L. Breeze
Principal Investigator
Covance Laboratories Inc.

[redacted]

[redacted]

1.0 Regulatory Compliance

1.1 GLP Compliance

This is a product characterization study as defined by section §160.135(b) of the United States Environmental Protection Agency (EPA) Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Good Laboratory Practice Standards (40 CFR Part 160) intended to characterize the physical and/or chemical properties of a potential commercial product. This study will be conducted in compliance with all requirements of section §160.135(b).

1.2 APHIS Compliance

The test substance(s) in this study are regulated genetically modified plant materials, therefore, strict adherence to APHIS, CFIA or other related regulations is required. Shipping and maintenance of plant material will be done in such a way that there is no release into the environment and that regulated material is not mixed with non-regulated material.

2.0 Purpose

The purpose of this study is to conduct compositional analyses of Roundup Ready® corn line NK603 forage and grain produced in 1999 E. U. field trials. The test line, NK603, contains a gene that encodes the expression of the CP4 5-enolpyruvylskikimate-3-phosphate synthase (CP4 EPSPS) protein which confers tolerance to Roundup® herbicide. The study also includes the analyses of an unmodified control line that has background genetics representative of the test line but does not express the CP4 EPSPS protein, and commercial reference lines from Study Plan #99-RR-01-F/It.

3.0 Timelines

3.1	Proposed Experimental Start Date:	April, 2000
3.2	Proposed Experimental Termination Date:	September, 2000

[redacted]

4.0 Test, Control and Reference Substances

4.1 Test Substance(s)

The test substance grown in 1999 E.U. field trials according to Study Plan 99-RR-01-F/It is as follows:

Line	Event	Description	Hybrid
Test	NK603	RR	LH82xNK603+/B73BC2S2

4.2 Control Substance

The control substance grown in 1999 E.U. field trials according to Study Plan 99-RR-01-F/It is as follows:

Line	Hybrid
Control	LH82xB73BC2S2

4.3 Reference Substance(s)

The reference substances were non-transgenic commercial corn varieties grown in 1999 E.U. field trials according to Study Plan 99-RR-01-F/It.

The commercial corn varieties varied by field site and are described below:

Reference Substance #	Site Number	Commercial Name	Origin of Seeds
Reference 1	Site 1	Anjou 285	Angevin
Reference 2	Site 1	Banguy	Nickerson
Reference 3	Site 1	Chantal	Asgrow
Reference 4	Site 1	Oural	Asgrow
Reference 5	Site 1	Rival	Asgrow
Reference 1	Site 2	Banguy	Nickerson
Reference 2	Site 2	DK 312	Ragt
Reference 3	Site 2	Liberal	Asgrow
Reference 4	Site 2	Radial	Asgrow
Reference 5	Site 2	Total	Asgrow
Reference 1	Site 3	Alvina	Pioneer
Reference 2	Site 3	Cecilia	Pioneer
Reference 3	Site 3	DK 300	Ragt
Reference 4	Site 3	Cherif	Verneuil semences
Reference 5	Site 3	Capitol	Maisadour
Reference 1	Site 4	Aramis	Dekalb 1609-05
Reference 2	Site 4	Kelada	Pioneer, I.A. 8404/9
Reference 3	Site 4	Tevere	Asgrow, 3003/05
Reference 4	Site 4	Santos	Dekalb, 1617/03
Reference 5	Site 4	Balka	Pioneer, 8473/1

[redacted]

4.4 Characterization of Test, Control and Reference Substances

The test/control/reference (T/C/R) substances will be characterized by the Sponsor prior to their use in this study. Characterization of T/C may include event-specific Southern blot or polymerase chain reaction (PCR) and confirmation by chain-of-custody records. Reference substances will be characterized by chain-of-custody records. Characterization data for the analytical reference standards are archived by Covance Laboratories, Inc.

4.5 Reserve Sample

Reserve samples are the responsibility of the Sponsor and will be stored in a -20 °C freezer until acceptance of the study data is completed.

5.0 Description of Experimental Design

Replicated plots of the test, control and reference lines, sampled for forage and grain from four field sites (Study Plan # 99-RR-01-F/It), will be analyzed to measure the component levels described in Section 5.1. Site locations are specified in Appendix I and sample identifiers are listed in Appendix II. Sample ID 875, Control grain sample from Site 3, replicate 4 (Identifier: Control-FS34-G), will not be analyzed since PCR analysis indicated contamination of this sample with NK603. Samples to be analyzed have been processed by the Sponsor according to SOPs BtM-PRO-067-01 and ES-PO-0064-01 and stored in a - 20 °C freezer pending compositional analysis. Sub-samples to be analyzed by Covance will be identified in worksheets and/or sample transfer forms.

5.1 Analytical Methods

Processed forage and grain subsamples will be shipped on dry ice to Covance by overnight delivery. These samples will be labeled minimally with the protocol number, tissue type, storage conditions, and a unique sample ID number. The unique sample ID number will permit association of the sample with its date of collection by reference to Study Plan # 99-RR-01-F/It. Samples will be stored in a -20 °C freezer until analysis. Covance may perform additional processing as necessary. Any unused tissue samples will either be returned to the Sponsor or properly disposed of upon approval by the Study Director.

The following analyses will be performed on **forage** samples:

Analyte	Method Mnemonic
Proximates	
Moisture	M100
Protein	PGEN
Fat	FAAH
Ash	ASHM
Acid detergent fiber	ADF
Neutral detergent fiber	NDFE

In addition, carbohydrate (CHO) values will be estimated by calculation.

[redacted]

The following analyses will be performed on **grain** samples:

Analyte	Method Mnemonic
Proximates	
Moisture	M100
Protein	PGEN
Fat	FSOX
Ash	ASHM
Acid detergent fiber	ADF
Neutral detergent fiber	NDFE
Amino acid composition	TAAP
Fatty acid profile (C8-C22)	FAPM
Vitamin E	EFD2
Phytic acid	PHYT
Trypsin inhibitor	TRIP
Minerals	ICPS
calcium, copper, iron, magnesium,	
manganese, phosphorus, potassium	
sodium, zinc	

Carbohydrate (CHO) values in grain will be determined by calculation.

Any additional compositional analyses or re-analyses will be documented and justified in the raw data file. Appropriate standards will be used in each assay as reference standards for the analytical procedures or calibration of equipment.

The analytical methods used for this study will be approved by the Study Director and that approval will be documented in the study file.

6.0 Proposed Statistical Methods

Statistical analyses are the responsibility of the Sponsor. Statistical analysis of the composition data will be performed using established methods. Means and ranges will be computed across sites for each component analyzed. Mean component values of test, control and reference lines will be compared by appropriate methods in order to determine substantial equivalence.

7.0 Control of Bias

The T/C/R substances from each respective test site were produced under the same agronomic conditions. The samples will be analyzed by test site in a non-systematic manner, generated by Monsanto and provided to Covance, to minimize assay bias.

8.0 Final Report

A quality control checked and Quality Assurance accepted analytical subreport generated by the Covance Principal Investigator will be submitted to the Monsanto

[redacted]

Study Director. A final subreport including a data summary spreadsheet, reference standards (where applicable) for each assay and method summaries will be submitted in a format acceptable to the study director. One copy of the draft report and two copies of the final subreport will be provided to the study director.

9.0 Records to be Maintained

9.1 Covance

Original data or copies will be available at Covance to facilitate auditing the study during its progress and before acceptance of the final sub-report. A final analytical report, including a compositional analyses summary spreadsheet accepted by the Covance Quality Assurance Unit, will be sent to the sponsor. All data relating to or generated by the project, including (if applicable) protocol, protocol amendments, a copy of the final analytical subreport, results, magnetically encoded records, laboratory notebooks, applicable standard operating procedures (SOPs) lists and any other information or records relating to the project will be retained in the archives of Covance in accordance with 40 CFR Part 160. Excess samples will be retained until notified of final disposition by the Sponsor.

Supporting records will be retained at Covance but will not be archived with the study data, including:

1. Instrument calibration and maintenance records
2. Storage area temperature records
3. Training records of study personnel

9.2 Monsanto

Records will be maintained of all sample transfers, analyses, the protocol and all deviations and amendments thereto and copies of all letters, memoranda and other correspondence related to this study. These documents may include: photocopies, computer generated hard copies, or hand-written notes that describe the procedures used to generate data for this study. Upon completion of the study, the final report will be retained by the Sponsor in the Monsanto Biotechnology Regulatory Sciences Archive.

[redacted]

10.0 Changes to the Protocol

Planned changes to the protocol will be documented in the form of written protocol amendments and signed by the Study Director. Amendments will become part of the protocol and will be archived with the protocol. All other changes will be in the form of written protocol deviations and will be filed with the raw data. All changes to the protocol will be addressed in the final report.

[redacted]

APPENDIX I

E.U. Field Sites (Study Plan 99-BTRR-01-It/Sp)

Site Code	Location
F-N-Site 1	Germignonville France
F-N-Site 2	Janville France
F-S-Site 3	L'Isle Jourdain France
IT - Site 4	Bagnarola Italy

[redacted]

APPENDIX II

Sample Identifiers [a]

	F-N-Site 1	F-N-Site 2	F-S-Site 3	IT-Site 4
Test Number				
NK603 rep1	NK603-FN11	NK603-FN21	NK603-FS31	NK603-IT41
NK603 rep2	NK603-FN12	NK603-FN22	NK603-FS32	NK603-IT42
NK603 rep3	NK603-FN13	NK603-FN23	NK603-FS33	NK603-IT43
NK603 rep4	NK603-FN14	NK603-FN24	NK603-FS34	NK603-IT44
Control Number				
Control rep1	Control-FN11	Control-FN21	Control-FS31	Control-IT41
Control rep2	Control-FN12	Control-FN22	Control-FS32	Control-IT42
Control rep3	Control-FN13	Control-FN23	Control-FS33	Control-IT43
Control rep4	Control-FN14	Control-FN24		Control-IT44
Reference Number				
Reference1 rep1	Ref1-FN11	Ref1-FN21	Ref1-FS31	Ref1-IT41
Reference1 rep2	Ref1-FN12	Ref1-FN22	Ref1-FS32	Ref1-IT42
Reference1 rep3	Ref1-FN13	Ref1-FN23	Ref1-FS33	Ref1-IT43
Reference1 rep4	Ref1-FN14	Ref1-FN24	Ref1-FS34	Ref1-IT44
Reference2 rep1	Ref2-FN11	Ref2-FN21	Ref2-FS31	Ref2-IT41
Reference2 rep2	Ref2-FN12	Ref2-FN22	Ref2-FS32	Ref2-IT42
Reference2 rep3	Ref2-FN13	Ref2-FN23	Ref2-FS33	Ref2-IT43
Reference2 rep4	Ref2-FN14	Ref2-FN24	Ref2-FS34	Ref2-IT44
Reference3 rep1	Ref3-FN11	Ref3-FN21	Ref3-FS31	Ref3-IT41
Reference3 rep2	Ref3-FN12	Ref3-FN22	Ref3-FS32	Ref3-IT42
Reference3 rep3	Ref3-FN13	Ref3-FN23	Ref3-FS33	Ref3-IT43
Reference3 rep4	Ref3-FN14	Ref3-FN24	Ref3-FS34	Ref3-IT44
Reference4 rep1	Ref4-FN11	Ref4-FN21	Ref4-FS31	Ref4-IT41
Reference4 rep2	Ref4-FN12	Ref4-FN22	Ref4-FS32	Ref4-IT42
Reference4 rep3	Ref4-FN13	Ref4-FN23	Ref4-FS33	Ref4-IT43
Reference4 rep4	Ref4-FN14	Ref4-FN24	Ref4-FS34	Ref4-IT44
Reference5 rep1	Ref5-FN11	Ref5-FN21	Ref5-FS31	Ref5-IT41
Reference5 rep2	Ref5-FN12	Ref5-FN22	Ref5-FS32	Ref5-IT42
Reference5 rep3	Ref5-FN13	Ref5-FN23	Ref5-FS33	Ref5-IT43
Reference5 rep4	Ref5-FN14	Ref5-FN24	Ref5-FS34	Ref5-IT44

[a] Samples of forage and grain will be indicated by the addition of -F or -G, respectively, to the sample code.

[redacted]

Protocol Amendment Form **Amendment #: 1**

Monsanto Study #: **99-01-46-52**

Covance Study #: **6103-252**

Date changes implemented: September 27, 2000

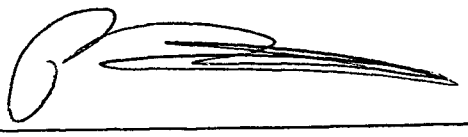
Page number(s) and section(s): Page 2, Approval signatures

Protocol originally stated: Ravinder S. Sidhu
Sponsor Representative
Monsanto Company
Biotechnology Regulatory Sciences

Protocol amended as follows Linda K. Lahman
Sponsor Representative
Monsanto Company
Biotechnology Regulatory Sciences

Reason for the amendment and what impact will result from this change:
Linda Lahman has assumed the responsibility for technical regulatory management of Roundup Ready® corn products and therefore will serve as Sponsor Representative.

Approved By:



Patrick T. Weston
Testing Facility Management Representative

Sep 22, 2000
Date

William P. Ridley

Sept 22, 2000

William P. Ridley
Study Director

Date

Linda K. Lahman

9/20/00

Linda K. Lahman
Sponsor Representative

Date

[redacted]

Protocol Amendment Form

Amendment #: 1

Reviewed By:

Barbara A. Foy
Quality Assurance Specialist

21 Sept 2000
Date

Matthew L. Breeze
Principle Investigator
Covance Laboratories, Inc.

26 Sept. 2000
Date

[redacted]

APPENDIX 2

Covance Laboratories, Inc., Final Analytical Subreport:

Compositional Analyses of Tissues Collected from Roundup® Tolerant Corn Line NK603 Grown in 1999 E.U. Field Trials

The following 122 pages are the final analytical subreport.

Final Analytical Subreport

Compositional Analyses of Tissues Collected from Roundup®Tolerant Corn Line NK603 Grown in 1999 E.U. Field Trials

PREPARED FOR:
Monsanto Company

COVANCE STUDY NUMBER:
6103-252

ISSUE DATE:
September 28, 2000

COVANCE.
THE DEVELOPMENT SERVICES COMPANY

Sponsor

Monsanto Company
St. Louis, Missouri

FINAL ANALYTICAL SUBREPORT

Subreport Title

Compositional Analyses of Tissues Collected from Roundup® Tolerant Corn Line NK603 Grown in 1999 E.U. Field Trials

Author

Matthew L. Breeze

Subreport Completion Date

September 28, 2000

Performing Laboratory

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704

Laboratory Study Identification

Covance 6103-252

Monsanto Study Number

99-01-46-52

QUALITY ASSURANCE STATEMENT

This report has been reviewed by the Quality Assurance Unit of Covance Laboratories Inc., in accordance with the Environmental Protection Agency (EPA) Good Laboratory Practice Standards, 40 CFR 160. The following inspections were conducted and findings reported to the principal investigator (PI), study director (SD), and associated management.

Inspection Dates			Date Reported to PI and	Date Reported to SD and
From	To	Phase	PI Management	SD Management
07/20/00	07/25/00	Analytical Lab Inspection	08/03/00	08/03/00
08/08/00	08/10/00	Data/Table Review	08/10/00	09/25/00
08/08/00	08/16/00	Data/Table Review	08/16/00	09/25/00
08/15/00	08/17/00	Data/Table Review	08/17/00	08/17/00
08/16/00	08/23/00	Data/Table Review	08/23/00	08/29/00
08/23/00	08/23/00	Data/Table Review	08/23/00	09/25/00
08/29/00	08/29/00	Data/Table Review	08/29/00	08/29/00
09/26/00	09/26/00	Report Review	09/26/00	09/28/00
09/28/00	09/28/00	Report Review	09/28/00	09/28/00

Tamara Fisher
Representative, Quality Assurance Unit

9/28/00
Date

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STUDY IDENTIFICATION

Compositional Analyses of Tissues Collected from Roundup®
Tolerant Corn Line NK603 Grown in 1999 E.U. Field Trials

Test Substances:

The test substance grown in 1999 E.U. field trials according to Study Plan 99-RR-01-F/It were as follows:

Line	Event	Description	Hybrid
Test	NK603	RR	LH82xNK603+/B73BC2S 2

Sponsor Study No.:

99-01-46-52

Sponsor Study Title:

Compositional Analyses of Tissues Collected from Roundup®Tolerant Corn Line NK603 Grown in 1999 E.U. Field Trials

Sponsor:

Monsanto Company
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Study Timetable

Study Initiation Date:	April 13, 2000
Analytical Start Date:	May 4, 2000
Analytical Completion Date:	August 5, 2000
Subreport Completion Date:	September 28, 2000

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Report Coordinator

Quality Assurance Unit

Nancy M. Centanni
Manager

Sample Management

Angela J. Underberg
Supervisor

INTRODUCTION

The purpose of this portion of the study was to conduct compositional analyses of RoundupReady® corn line NK603 forage and grain produced in 1999 E. U. field trials. The test line, NK603, contained a gene that encodes the expression of the CP4 5-enolpyruvylskikimate-3-phosphate synthase (CP4 EPSPS) protein which conferred tolerance to Roundup® herbicide. The study also included the analyses of an unmodified control line that had background genetics representative of the test line but did not express the CP4 EPSPS protein, and commercial reference lines. Replicated plots of the test, control and reference lines were sampled for forage and grain from four field sites (Study Plan # 99-RR-01-F/It).

Specifically, the study was designed to estimate the levels of proximates (moisture, protein, fat, and ash), acid detergent fiber, and neutral detergent fiber in the forage and grain. In addition, the grain was analyzed for amino acid composition, fatty acid profile, vitamin E, phytic acid, trypsin inhibitor, and minerals (calcium, copper, iron, magnesium, manganese, phosphorus, potassium, sodium, and zinc). In addition, the carbohydrate values in the forage and grain were estimated by calculation.

REGULATORY COMPLIANCE

This study was conducted in compliance with the Environmental Protection Agency (EPA) Good Laboratory Practice (GLP) Standards as set forth in Title 40 of the US Code of Federal Regulations Part 160 with the exceptions that the reference standards were not characterized according to GLP standards, reserve samples from each batch of the reference standards were not retained, and that the final analytical subreport format is not in full accordance with EPA Pesticide Regulation Notice 86-5. These exceptions had no effect on the integrity or quality of the study.

TEST, CONTROL, AND REFERENCE SUBSTANCES

Identification

Test Substance

The test substance grown in 1999 E.U. field trials according to Study Plan 99-RR-01-F/It were as follows:

Line	Event	Description	Hybrid
Test	NK603	RR	LH82xNK603+/B73BC2S2

Control Substances

The control substances grown in 1999 E.U. field trials according to Study Plan 99-RR-01-F/It were as follows:

Line #	Hybrid
Control	LH82xB73BC2S2

Reference Substances

The reference substances were non-transgenic commercial corn varieties grown in 1999 E.U. field trials according to Study Plan 99-RR-01-F/It.

Appropriate reference standards were used in each assay as reference standards for the analytical procedures and equipment calibrations. See Appendix A for reference standard identification (if applicable).

Characterization, Purity, and Stability

Information on characterization, purity, stability, synthesis methods, composition, or other characteristics that define the test, control, and reference substances was the responsibility of the sponsor.

Storage/Retention

Upon arrival in the analytical laboratory, all samples were stored in a secured freezer set to maintain -20° ±10°C. Excess grain samples will be returned or discarded at the end of

the study at the direction of the study director. Remaining reference standards may be used for other testing.

Safety Precautions
Safety precautions were taken as required by Covance Policies and Procedures.

SAMPLE RECEIPT AND HANDLING

The samples were entered into the Covance Laboratory Information Management Systems (LIMS) with unique LIMS numbers. Each sample identification was matched with the LIMS information.

PROCEDURES

This study was conducted in accordance with Monsanto Study No. 99-01-46-52 (Covance Study No. 6103-252). All analyses were performed according to methods and standard operating procedures (SOPs) approved by Covance. See Appendix A for a summary of the analytical methods referenced by the method mnemonic. Listed in the following text tables are the components analyzed and units reported by the assay.

The following analyses were performed on the **forage** samples:

Analyte	Method Mnemonic	Units Reported by Assay
Proximates		
Moisture	M100	%[a]
Protein	PGEN	%[a]
Fat	FAAH	%[a]
Ash	ASHM	%[a]
Acid detergent fiber	ADF	%[a]
Neutral detergent fiber	NDFE	%[a]

[a] % = [g/g fresh weight] x 100

Carbohydrate (CHO) values were determined by calculation and reported as % = (g/g fresh weight) x 100.

The following analyses were performed on the **grain** samples:

Analyte	Method Mnemonic	Units Reported by Assay
Proximates		
Moisture	M100	%[a]
Protein	PGEN	%[a]
Fat	FSOX	%[a]
Ash	ASHM	%[a]
Acid detergent fiber	ADF	%[a]
Neutral detergent fiber	NDFE	%[a]
Amino acid composition	TAAP	mg/g fresh weight
Fatty acid profile (C8-C22)	FAPM	%[a]
Vitamin E	EFD2	mg/g fresh weight
Phytic acid	PHYT	%[a]
Trypsin inhibitor	TRIP	Trypsin Inhibitor Unit (TIU)/mg fresh weight
Minerals: calcium, copper, iron, magnesium, manganese, phosphorus, potassium sodium, zinc	ICPS	ppm[b]

[a] % = [g/g fresh weight] x 100
[b] ppm = µg/g fresh weight

Carbohydrate (CHO) values were determined by calculation and reported as % = (g/g fresh weight) x 100.

The samples were analyzed by test site in a non-systematic manner, generated by Monsanto and provided to Covance, to minimize assay bias. A minimum frequency of 10% quality control samples (duplicates, recoveries, certified reference standards, blanks, or validated control samples) were prepared and analyzed at Covance. Additional analyses or re-analyses were documented and justified in the raw data.

STATISTICAL METHODS

No statistical analysis of the data was performed at Covance. Statistical analyses are the responsibility of Monsanto Company.

MAINTENANCE OF RAW DATA AND RECORDS

A final analytical subreport, including a compositional analyses summary spreadsheet accepted by the Covance Quality Assurance Unit, will be sent to the sponsor. All data relating to or generated by the project, including (if applicable) protocol, protocol amendments, a copy of the final analytical subreport, results, magnetically encoded records, laboratory notebooks, applicable SOPs lists and any other information or records relating to the project will be retained in the archives of Covance in accordance with 40 CFR Part 160. One year after signing of the final report, all of the aforementioned materials will be returned to the sponsor.

The supporting records retained at Covance, but not archived with the study data, include the following items:

Storage area temperature records
Instrument calibration and maintenance records
Employee training records

RESULTS

The results for the compositional analyses of the forage and grain samples are presented in Tables 1 and 2, respectively. All of the results are on a fresh-weight basis.

SIGNATURES

Matthew L. Breeze
Principal Investigator
Vitamin Chemistry
Covance Laboratories Inc.

9-28-00
Date

Robert G. Allen
Manager
Inorganic Chemistry
Covance Laboratories Inc.

9/28/00
Date

Table 1
Forage Compositional Analyses

Site: FN-1, Germignonville, France

Monsanto ID	Europe-726	Europe-727	Europe-728	Europe-729
Sample Identifier	NK603-FN11-F	NK603-FN12-F	NK603-FN13-F	NK603-FN14-F
Covance LIMS	00404873	00404865	00404859	00404870
Proximate (%)				
Protein	1.71	1.65	1.41	2.17
Moisture	78.8	79.6	78.7	75.8
Total Fat	0.300	0.358	0.755	0.493
Ash	1.10	0.940	1.13	1.38
Carbohydrates	18.1	17.5	18.0	20.2
Acid detergent fiber	6.62	6.14	6.12	6.81
Neutral detergent fiber	9.79	9.04	10.3	9.91

Monsanto ID	Europe-730	Europe-731	Europe-732	Europe-733
Sample Identifier	Control-FN11-F	Control-FN12-F	Control-FN13-F	Control-FN14-F
Covance LIMS	00404861	00404885	00404876	00404872
Proximate (%)				
Protein	2.77	1.90	1.34	1.74
Moisture	75.4	76.6	76.1	77.4
Total Fat	0.758	0.845	0.377	0.471
Ash	1.97	1.44	1.36	1.43
Carbohydrates	19.1	19.2	20.8	19.0
Acid detergent fiber	6.73	6.16	6.85	6.86
Neutral detergent fiber	10.1	9.93	9.50	10.5

Table 1 (Continued)
Forage Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-734	Europe-735	Europe-736	Europe-737
Sample Identifier	Ref1-FN11-F	Ref1-FN12-F	Ref1-FN13-F	Ref1-FN14-F
Covance LIMS	00404868	00404881	00404860	00404871
Proximate (%)				
Protein	1.81	1.64	1.42	1.82
Moisture	73.8	74.2	71.5	73.3
Total Fat	0.467	0.669	0.595	0.520
Ash	1.84	1.78	2.00	2.02
Carbohydrates	22.1	21.7	24.5	22.3
Acid detergent fiber	8.03	9.54	8.66	9.26
Neutral detergent fiber	12.2	12.3	15.1	13.0

Monsanto ID	Europe-738	Europe-739	Europe-740	Europe-741
Sample Identifier	Ref2-FN11-F	Ref2-FN12-F	Ref2-FN13-F	Ref2-FN14-F
Covance LIMS	00404863	00404874	00404862	00404867
Proximate (%)				
Protein	1.92	2.20	1.48	1.70
Moisture	74.5	72.6	77.2	78.2
Total Fat	0.550	0.572	0.540	0.522
Ash	1.89	1.65	1.04	1.80
Carbohydrates	21.1	23.0	19.7	17.8
Acid detergent fiber	7.72	8.15	7.55	7.41
Neutral detergent fiber	11.0	12.2	9.16	11.8

Table 1 (Continued)
Forage Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-742	Europe-743	Europe-744	Europe-745
Sample Identifier	Ref3-FN11-F	Ref3-FN12-F	Ref3-FN13-F	Ref3-FN14-F
Covance LIMS	00404875	00404864	00404886	00404869
Proximate (%)				
Protein	1.63	1.73	2.02	1.68
Moisture	77.5	76.1	72.8	75.6
Total Fat	0.580	0.584	0.795	0.423
Ash	1.78	1.57	1.63	1.80
Carbohydrates	18.5	20.0	22.8	20.5
Acid detergent fiber	7.20	6.46	7.62	7.17
Neutral detergent fiber	10.0	10.5	11.7	10.7

Monsanto ID	Europe-746	Europe-747	Europe-748	Europe-750
Sample Identifier	Ref4-FN11-F	Ref4-FN12-F	Ref4-FN13-F	Ref4-FN14-F
Covance LIMS	00404877	00404879	00404884	00404878
Proximate (%)				
Protein	1.59	1.78	1.38	1.65
Moisture	77.4	76.8	77.9	74.6
Total Fat	0.631	0.622	1.01	0.593
Ash	1.83	1.88	2.13	1.79
Carbohydrates	18.5	18.9	17.6	21.4
Acid detergent fiber	7.55	7.54	7.84	9.73
Neutral detergent fiber	9.65	10.6	12.1	12.8

Table 1 (Continued)
Forage Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-751	Europe-752	Europe-753	Europe-754
Sample Identifier	Ref5-FN11-F	Ref5-FN12-F	Ref5-FN13-F	Ref5-FN14-F
Covance LIMS	00404882	00404880	00404866	00404883
Proximate (%)				
Protein	1.53	1.40	2.12	1.84
Moisture	75.6	75.9	75.4	79.7
Total Fat	0.761	0.385	0.718	0.614
Ash	2.04	1.86	2.02	1.78
Carbohydrates	20.1	20.5	19.7	16.1
Acid detergent fiber	8.79	8.24	7.32	6.72
Neutral detergent fiber	11.2	11.8	11.3	10.4

Table 1 (Continued)
Forage Compositional Analyses

Site: FN-2, Janville, France

Monsanto ID	Europe-783	Europe-784	Europe-785	Europe-786
Sample Identifier	NK603-FN21-F	NK603-FN22-F	NK603-FN23-F	NK603-FN24-F
Covance LIMS	00404908	00404892	00404900	00404902
Proximate (%)				
Protein	2.05	1.58	1.79	2.01
Moisture	77.6	79.8	78.1	78.1
Total Fat	0.776	0.539	0.733	0.538
Ash	1.15	1.05	1.21	1.23
Carbohydrates	18.4	17.0	18.2	18.1
Acid detergent fiber	4.97	5.33	6.11	5.48
Neutral detergent fiber	9.64	7.43	9.64	9.99

Monsanto ID	Europe-787	Europe-788	Europe-789	Europe-790
Sample Identifier	Control-FN21-F	Control-FN22-F	Control-FN23-F	Control-FN24-F
Covance LIMS	00404893	00404905	00404889	00404901
Proximate (%)				
Protein	2.08	2.15	1.91	1.69
Moisture	79.5	78.9	77.8	81.3
Total Fat	0.424	0.452	0.378	0.614
Ash	1.09	1.03	1.53	1.09
Carbohydrates	16.9	17.5	18.4	15.3
Acid detergent fiber	5.90	4.85	6.10	5.22
Neutral detergent fiber	6.95	8.54	8.73	7.12

Table 1 (Continued)
Forage Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-791	Europe-792	Europe-793	Europe-794
Sample Identifier	Ref1-FN21-F	Ref1-FN22-F	Ref1-FN23-F	Ref1-FN24-F
Covance LIMS	00404891	00404895	00404897	00404912
Proximate (%)				
Protein	1.77	1.84	1.82	2.16
Moisture	79.8	76.7	77.8	74.2
Total Fat	0.575	0.372	0.746	0.639
Ash	1.57	1.53	1.78	1.48
Carbohydrates	16.3	19.6	17.9	21.5
Acid detergent fiber	6.67	7.48	7.18	6.44
Neutral detergent fiber	9.04	9.92	9.04	11.5

Monsanto ID	Europe-795	Europe-796	Europe-797	Europe-798
Sample Identifier	Ref2-FN21-F	Ref2-FN22-F	Ref2-FN23-F	Ref2-FN24-F
Covance LIMS	00404913	00404890	00404907	00404898
Proximate (%)				
Protein	2.03	1.69	1.77	1.88
Moisture	79.1	79.6	79.4	79.7
Total Fat	0.363	0.602	0.381	0.620
Ash	1.21	1.63	1.25	1.28
Carbohydrates	17.3	16.5	17.2	16.5
Acid detergent fiber	5.69	6.18	6.73	7.66
Neutral detergent fiber	9.61	9.19	10.3	8.07

Table 1 (Continued)
Forage Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-799	Europe-800	Europe-801	Europe-802
Sample Identifier	Ref3-FN21-F	Ref3-FN22-F	Ref3-FN23-F	Ref3-FN24-F
Covance LIMS	00404899	00404904	00404911	00404888
Proximate (%)				
Protein	2.16	1.87	2.00	1.94
Moisture	78.4	77.5	78.0	79.4
Total Fat	0.669	0.719	0.400	0.569
Ash	1.77	1.44	1.83	1.71
Carbohydrates	17.0	18.5	17.8	16.4
Acid detergent fiber	6.38	6.68	6.30	7.06
Neutral detergent fiber	9.65	10.0	11.1	9.36

Monsanto ID	Europe-803	Europe-804	Europe-805	Europe-806
Sample Identifier	Ref4-FN21-F	Ref4-FN22-F	Ref4-FN23-F	Ref4-FN24-F
Covance LIMS	00404914	00404906	00404910	00404887
Proximate (%)				
Protein	2.64	2.84	2.41	2.30
Moisture	75.1	75.0	75.5	76.0
Total Fat	0.599	0.523	0.687	0.588
Ash	1.50	1.42	1.29	1.41
Carbohydrates	20.2	20.2	20.1	19.7
Acid detergent fiber	5.72	5.58	6.26	6.31
Neutral detergent fiber	11.1	10.1	9.82	9.01

Table 1 (Continued)
Forage Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-807	Europe-808	Europe-809	Europe-810
Sample Identifier	Ref5-FN21-F	Ref5-FN22-F	Ref5-FN23-F	Ref5-FN24-F
Covance LIMS	00404909	00404896	00404894	00404903
Proximate (%)				
Protein	1.99	1.99	2.58	2.45
Moisture	80.2	80.4	76.6	78.8
Total Fat	0.587	0.552	0.796	0.713
Ash	1.51	1.65	1.84	1.82
Carbohydrates	15.7	15.4	18.2	16.2
Acid detergent fiber	5.85	6.38	6.76	6.84
Neutral detergent fiber	10.7	9.94	9.24	10.5

Table 1 (Continued)
Forage Compositional Analyses

Site: FS-3, L'Isle Jourdain, France

Monsanto ID	Europe-839	Europe-840	Europe-841	Europe-842
Sample Identifier	NK603-FS31-F	NK603-FS32-F	NK603-FS33-F	NK603-FS34-F
Covance LIMS	00404928	00404924	00404935	00404929
Proximate (%)				
Protein	2.87	2.72	2.35	3.03
Moisture	63.3	63.4	63.1	61.6
Total Fat	1.19	1.29	1.21	1.39
Ash	1.40	1.49	1.04	1.39
Carbohydrates	31.2	31.1	32.3	32.6
Acid detergent fiber	8.06	8.40	9.59	7.40
Neutral detergent fiber	12.8	13.2	14.1	12.2

Monsanto ID	Europe-843	Europe-844	Europe-845
Sample Identifier	Control-FS31-F	Control-FS32-F	Control-FS33-F
Covance LIMS	00404939	00404936	00404923
Proximate (%)			
Protein	2.86	3.66	2.42
Moisture	62.7	60.4	65.6
Total Fat	1.29	1.59	1.23
Ash	1.25	1.45	1.50
Carbohydrates	31.9	32.9	29.3
Acid detergent fiber	7.95	7.68	6.75
Neutral detergent fiber	13.2	13.8	14.4

Table 1 (Continued)
Forage Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-847	Europe-848	Europe-849	Europe-850
Sample Identifier	Ref1-FS31-F	Ref1-FS32-F	Ref1-FS33-F	Ref1-FS34-F
Covance LIMS	00404941	00404937	00404927	00404933
Proximate (%)				
Protein	2.87	2.86	2.78	2.74
Moisture	58.2	62.4	65.6	62.6
Total Fat	1.53	1.38	1.26	1.40
Ash	1.34	1.37	1.50	1.40
Carbohydrates	36.1	32.0	28.9	31.9
Acid detergent fiber	9.24	8.26	9.04	9.06
Neutral detergent fiber	14.5	14.1	14.5	13.9

Monsanto ID	Europe-851	Europe-852	Europe-853	Europe-854
Sample Identifier	Ref2-FS31-F	Ref2-FS32-F	Ref2-FS33-F	Ref2-FS34-F
Covance LIMS	00404915	00404938	00404940	00404918
Proximate (%)				
Protein	2.59	2.63	2.77	2.49
Moisture	63.3	61.9	64.0	63.5
Total Fat	1.53	1.47	1.09	1.25
Ash	0.893	0.945	0.896	0.898
Carbohydrates	31.7	33.1	31.2	31.9
Acid detergent fiber	7.49	7.01	6.46	7.98
Neutral detergent fiber	11.8	10.9	11.0	11.8

Table 1 (Continued)
Forage Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-855	Europe-856	Europe-858	Europe-859
Sample Identifier	Ref3-FS31-F	Ref3-FS32-F	Ref3-FS33-F	Ref3-FS34-F
Covance LIMS	00404919	00404917	00404931	00404920
Proximate (%)				
Protein	3.07	2.86	3.05	3.51
Moisture	62.0	59.8	63.6	61.5
Total Fat	1.23	1.32	1.36	1.40
Ash	1.54	1.29	1.59	1.25
Carbohydrates	32.2	34.7	30.4	32.3
Acid detergent fiber	10.0	9.82	9.77	8.71
Neutral detergent fiber	15.5	14.6	15.3	14.3

Monsanto ID	Europe-860	Europe-861	Europe-862	Europe-863
Sample Identifier	Ref4-FS31-F	Ref4-FS32-F	Ref4-FS33-F	Ref4-FS34-F
Covance LIMS	00404932	00404934	00404921	00404922
Proximate (%)				
Protein	2.90	3.28	2.86	3.17
Moisture	58.2	57.4	59.1	59.2
Total Fat	1.22	1.28	1.37	1.39
Ash	1.49	1.29	1.45	1.29
Carbohydrates	36.2	36.8	35.2	35.0
Acid detergent fiber	10.3	7.47	8.56	9.11
Neutral detergent fiber	16.0	12.8	15.0	15.1

Table 1 (Continued)
Forage Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-864	Europe-865	Europe-866	Europe-867
Sample Identifier	Ref5-FS31-F	Ref5-FS32-F	Ref5-FS33-F	Ref5-FS34-F
Covance LIMS	00404926	00404916	00404925	00404930
Proximate (%)				
Protein	3.85	3.29	3.24	3.21
Moisture	56.5	57.9	59.9	60.1
Total Fat	1.75	1.32	1.21	1.45
Ash	1.50	1.32	1.35	1.41
Carbohydrates	36.4	36.2	34.3	33.8
Acid detergent fiber	8.87	8.76	10.8	9.29
Neutral detergent fiber	15.5	16.4	18.3	16.4

Table 1 (Continued)
Forage Compositional Analyses

Site: IT-4, Bagnarola, Italy

Monsanto ID	Europe-896	Europe-897	Europe-898	Europe-899
Sample Identifier	NK603-IT41-F	NK603-IT42-F	NK603-IT43-F	NK603-IT44-F
Covance LIMS	00404943	00404949	00404964	00404959
Proximate (%)				
Protein	2.80	3.01	2.39	2.97
Moisture	69.9	72.1	75.2	71.6
Total Fat	1.35	0.852	0.510	0.758
Ash	1.16	1.44	1.30	1.83
Carbohydrates	24.8	22.6	20.6	22.8
Acid detergent fiber	7.53	6.43	6.48	6.78
Neutral detergent fiber	11.8	9.52	11.0	11.4

Monsanto ID	Europe-900	Europe-901	Europe-902	Europe-903
Sample Identifier	Control-IT41-F	Control-IT42-F	Control-IT43-F	Control-IT44-F
Covance LIMS	00404957	00404955	00404951	00404965
Proximate (%)				
Protein	2.68	3.55	3.05	2.45
Moisture	72.3	67.6	66.9	72.6
Total Fat	0.791	0.842	0.692	0.584
Ash	1.59	1.88	1.30	1.35
Carbohydrates	22.6	26.1	28.1	23.0
Acid detergent fiber	6.47	7.10	7.67	7.37
Neutral detergent fiber	10.9	12.3	12.3	10.9

Table 1 (Continued)
Forage Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-904	Europe-905	Europe-906	Europe-907
Sample Identifier	Ref1-IT41-F	Ref1-IT42-F	Ref1-IT43-F	Ref1-IT44-F
Covance LIMS	00404944	00404942	00404966	00404961
Proximate (%)				
Protein	2.90	2.68	2.93	2.60
Moisture	70.4	72.6	66.4	68.4
Total Fat	1.09	1.06	0.669	0.675
Ash	1.35	1.35	1.29	1.45
Carbohydrates	24.3	22.3	28.7	26.9
Acid detergent fiber	6.25	6.76	8.28	8.29
Neutral detergent fiber	9.87	10.5	12.7	12.1

Monsanto ID	Europe-908	Europe-909	Europe-910	Europe-911
Sample Identifier	Ref2-IT41-F	Ref2-IT42-F	Ref2-IT43-F	Ref2-IT44-F
Covance LIMS	00404953	00404960	00404963	00404969
Proximate (%)				
Protein	2.39	2.21	2.61	2.43
Moisture	71.2	73.9	70.9	73.2
Total Fat	0.606	0.370	0.644	0.486
Ash	1.05	1.45	1.23	1.30
Carbohydrates	24.8	22.1	24.6	22.6
Acid detergent fiber	6.95	7.70	6.41	6.77
Neutral detergent fiber	10.2	12.2	9.29	10.6

Table 1 (Continued)
Forage Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-912	Europe-913	Europe-914	Europe-915
Sample Identifier	Ref3-IT41-F	Ref3-IT42-F	Ref3-IT43-F	Ref3-IT44-F
Covance LIMS	00404945	00404962	00404952	00404954
Proximate (%)				
Protein	2.06	2.80	3.29	2.73
Moisture	73.5	71.3	67.4	67.2
Total Fat	0.899	0.655	1.13	0.658
Ash	1.04	1.54	1.57	0.991
Carbohydrates	22.5	23.7	26.6	28.4
Acid detergent fiber	7.03	7.36	6.45	8.12
Neutral detergent fiber	10.0	11.2	10.9	12.6

Monsanto ID	Europe-916	Europe-917	Europe-918	Europe-919
Sample Identifier	Ref4-IT41-F	Ref4-IT42-F	Ref4-IT43-F	Ref4-IT44-F
Covance LIMS	00404947	00404956	00404968	00404958
Proximate (%)				
Protein	2.41	2.11	2.26	2.14
Moisture	70.7	73.9	73.1	71.7
Total Fat	0.804	0.435	0.489	0.549
Ash	1.15	1.33	1.29	1.06
Carbohydrates	24.9	22.2	22.9	24.6
Acid detergent fiber	8.04	9.01	7.63	7.34
Neutral detergent fiber	12.1	13.0	11.8	11.0

Table 1 (Continued)
Forage Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-920	Europe-921	Europe-922	Europe-923
Sample Identifier	Ref5-IT41-F	Ref5-IT42-F	Ref5-IT43-F	Ref5-IT44-F
Covance LIMS	00404950	00404946	00404948	00404967
Proximate (%)				
Protein	2.42	2.74	3.00	2.57
Moisture	67.9	69.5	65.7	71.3
Total Fat	0.726	1.20	1.38	0.605
Ash	1.34	1.19	1.30	1.49
Carbohydrates	27.6	25.4	28.6	24.0
Acid detergent fiber	7.32	6.11	6.07	6.35
Neutral detergent fiber	10.2	9.52	9.58	9.93

Table 2
Grain Compositional Analyses

Site: FN-1, Germignonville, France

Monsanto ID	Europe-755	Europe-756	Europe-757	Europe-758
Sample Identifier	NK603-FN11-G	NK603-FN12-G	NK603-FN13-G	NK603-FN14-G
Covance LIMS	00406643	00406652	00406659	00406650
Proximate (%)				
Protein	13.7	12.7	12.2	13.1
Moisture	8.05	8.02	8.21	8.34
Total Fat	4.08	3.97	3.77	3.92
Ash	1.62	1.71	1.66	1.64
Carbohydrates	72.6	73.6	74.2	73.0
Acid detergent fiber	3.09	3.07	2.92	3.30
Neutral detergent fiber	9.04	9.98	10.3	10.7
Vitamin E (mg/g)	0.00549	0.00506	0.00546	0.00585
Phytic acid (%)	0.832	0.832	0.930	0.913
Trypsin inhibitor (TIU/mg)	2.16	2.22	2.27	1.98
Minerals (ppm)				
Calcium	70.8	72.5	70.0	70.1
Copper	1.59	1.57	1.74	1.52
Iron	19.5	18.5	17.4	17.8
Magnesium	1110	1180	1160	1130
Manganese	7.48	6.88	6.76	7.56
Phosphorus	3440	3540	3490	3460
Potassium	3920	4060	3970	3830
Sodium	<100	<100	<100	<100
Zinc	22.7	21.9	21.9	22.5

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-755	Europe-756	Europe-757	Europe-758
Sample Identifier	NK603-FN11-G	NK603-FN12-G	NK603-FN13-G	NK603-FN14-G
Covance LIMS	00406643	00406652	00406659	00406650
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.324	0.321	0.308	0.314
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0494	0.0537	0.0536	0.0563
18:1 oleic	0.795	0.779	0.757	0.783
18:2 linoleic	2.63	2.48	2.45	2.49
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0400	0.0374	0.0381	0.0375
20:0 arachidic	0.0142	0.0136	0.0133	0.0134
20:1 eicosenoic	0.0119	0.0111	0.0107	0.0109
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	<0.00400	0.00553	0.00479	0.00541

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-755	Europe-756	Europe-757	Europe-758
Sample Identifier	NK603-FN11-G	NK603-FN12-G	NK603-FN13-G	NK603-FN14-G
Covance LIMS	00406643	00406652	00406659	00406650
Amino Acids (mg/g)				
Aspartic Acid	9.43	9.29	8.21	8.66
Threonine	4.61	4.16	4.06	4.31
Serine	6.78	6.18	5.73	6.84
Glutamic Acid	29.1	27.3	24.3	27.2
Proline	13.0	11.9	10.8	12.2
Glycine	4.37	4.27	4.02	4.09
Alanine	11.5	10.7	9.56	10.8
Cystine	2.27	2.38	2.28	2.38
Valine	6.92	6.51	5.96	6.19
Methionine	2.39	2.40	2.22	2.46
Isoleucine	5.53	5.09	4.60	4.90
Leucine	20.8	19.0	17.0	19.4
Tyrosine	5.20	4.95	4.57	4.95
Phenylalanine	7.64	7.14	6.32	7.10
Histidine	3.57	3.36	3.15	3.27
Lysine	3.52	3.90	3.25	3.13
Arginine	5.18	4.80	4.71	4.62
Tryptophan	0.684	0.673	0.642	0.665

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-759	Europe-760	Europe-761	Europe-762
Sample Identifier	Control-FN11-G	Control-FN12-G	Control-FN13-G	Control-FN14-G
Covance LIMS	00406655	00406656	00406645	00406661
Proximate (%)				
Protein	13.1	12.0	13.1	12.6
Moisture	8.06	8.27	8.33	7.87
Total Fat	3.31	3.49	3.60	3.50
Ash	1.82	1.68	1.65	1.66
Carbohydrates	73.7	74.6	73.3	74.4
Acid detergent fiber	3.09	3.07	2.95	3.52
Neutral detergent fiber	10.5	10.9	11.0	11.5
Vitamin E (mg/g)	0.00591	0.00523	0.00568	0.00558
Phytic acid (%)	1.03	0.762	1.00	1.01
Trypsin inhibitor (TIU/mg)	1.57	1.77	2.35	1.71
Minerals (ppm)				
Calcium	72.5	65.6	70.7	72.3
Copper	1.64	1.52	1.62	1.54
Iron	19.5	16.5	18.6	21.3
Magnesium	1200	1040	1210	1190
Manganese	7.99	6.74	7.70	7.91
Phosphorus	3660	3190	3660	3570
Potassium	4490	3790	4330	4310
Sodium	<100	<100	<100	<100
Zinc	24.3	20.8	23.6	22.2

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-759	Europe-760	Europe-761	Europe-762
Sample Identifier	Control-FN11-G	Control-FN12-G	Control-FN13-G	Control-FN14-G
Covance LIMS	00406655	00406656	00406645	00406661
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.268	0.281	0.265	0.280
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0465	0.0486	0.0449	0.0475
18:1 oleic	0.656	0.698	0.654	0.682
18:2 linoleic	2.03	2.19	2.07	2.18
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0312	0.0350	0.0327	0.0356
20:0 arachidic	0.0113	0.0117	0.0113	0.0118
20:1 eicosenoic	0.00951	0.00984	0.00938	0.00998
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00485	0.00474	0.00423	0.00499

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-759	Europe-760	Europe-761	Europe-762
Sample Identifier	Control-FN11-G	Control-FN12-G	Control-FN13-G	Control-FN14-G
Covance LIMS	00406655	00406656	00406645	00406661
Amino Acids (mg/g)				
Aspartic Acid	9.62	8.52	8.59	8.75
Threonine	4.24	3.97	4.22	4.16
Serine	6.27	5.86	6.17	6.00
Glutamic Acid	27.7	25.0	26.4	25.2
Proline	12.2	11.3	12.3	11.3
Glycine	4.43	4.14	4.09	4.28
Alanine	10.7	9.90	10.4	9.89
Cystine	2.30	2.27	2.36	2.48
Valine	6.64	6.14	6.27	6.23
Methionine	2.45	2.19	2.43	2.55
Isoleucine	5.18	4.83	5.00	4.83
Leucine	19.0	17.4	18.8	17.3
Tyrosine	5.06	4.60	4.81	4.63
Phenylalanine	7.08	6.53	6.91	6.54
Histidine	3.45	3.28	3.36	3.37
Lysine	3.83	3.40	3.18	3.53
Arginine	4.94	4.82	4.78	5.40
Tryptophan	0.699	0.648	0.778	0.769

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-763	Europe-764	Europe-765	Europe-766
Sample Identifier	Ref1-FN11-G	Ref1-FN12-G	Ref1-FN13-G	Ref1-FN14-G
Covance LIMS	00406648	00406660	00406667	00406644
Proximate (%)				
Protein	9.75	9.24	9.14	9.42
Moisture	7.91	7.82	8.09	8.35
Total Fat	4.10	3.65	3.37	3.85
Ash	1.24	1.41	1.57	1.38
Carbohydrates	77.0	77.9	77.8	77.0
Acid detergent fiber	3.06	3.25	2.86	2.85
Neutral detergent fiber	9.75	8.60	9.45	8.72
Vitamin E (mg/g)	0.00540	0.00605	0.00591	0.00654
Phytic acid (%)	1.03	0.827	0.611	0.765
Trypsin inhibitor (TIU/mg)	2.16	1.36	1.11	2.48
Minerals (ppm)				
Calcium	46.9	46.5	45.1	47.6
Copper	1.66	1.67	1.64	1.62
Iron	18.5	17.3	17.5	17.8
Magnesium	1110	1140	1110	1100
Manganese	7.23	6.96	6.85	6.81
Phosphorus	3110	3160	3150	3160
Potassium	3250	3380	3330	3350
Sodium	<100	<100	<100	<100
Zinc	19.7	20.5	19.0	18.8

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-763	Europe-764	Europe-765	Europe-766
Sample Identifier	Refl-FN11-G	Refl-FN12-G	Refl-FN13-G	Refl-FN14-G
Covance LIMS	00406648	00406660	00406667	00406644
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.479	0.431	0.393	0.452
16:1 palmitoleic	0.00568	0.00525	0.00467	0.00705
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0613	0.0554	0.0501	0.0565
18:1 oleic	0.904	0.800	0.749	0.858
18:2 linoleic	2.27	2.07	1.88	2.18
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0520	0.0489	0.0435	0.0499
20:0 arachidic	0.0133	0.0124	0.0113	0.0129
20:1 eicosenoic	0.00993	0.00924	0.00853	0.00976
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00567	0.00508	0.00458	0.00556

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-763	Europe-764	Europe-765	Europe-766
Sample Identifier	Refl-FN11-G	Refl-FN12-G	Refl-FN13-G	Refl-FN14-G
Covance LIMS	00406648	00406660	00406667	00406644
Amino Acids (mg/g)				
Aspartic Acid	6.09	5.92	5.82	6.12
Threonine	3.20	3.15	3.11	3.25
Serine	4.74	4.42	4.34	4.54
Glutamic Acid	19.0	17.9	18.0	18.3
Proline	9.71	8.77	8.74	9.38
Glycine	3.50	3.44	3.31	3.44
Alanine	7.54	7.06	7.08	7.24
Cystine	2.05	2.09	2.01	2.01
Valine	4.98	4.78	4.71	4.93
Methionine	1.92	1.87	1.87	1.82
Isoleucine	3.59	3.36	3.39	3.49
Leucine	13.0	12.0	12.2	12.5
Tyrosine	3.46	3.21	3.14	3.41
Phenylalanine	4.87	4.51	4.58	4.76
Histidine	2.91	2.81	2.75	2.85
Lysine	2.70	2.70	2.50	2.78
Arginine	4.13	4.10	3.88	4.17
Tryptophan	0.553	0.534	0.586	0.538

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-767	Europe-768	Europe-769	Europe-770
Sample Identifier	Ref2-FN11-G	Ref2-FN12-G	Ref2-FN13-G	Ref2-FN14-G
Covance LIMS	00406668	00406664	00406657	00406663
Proximate (%)				
Protein	9.13	9.14	8.55	8.94
Moisture	8.54	8.53	8.36	8.33
Total Fat	4.05	3.72	3.55	4.15
Ash	1.38	1.25	1.46	1.33
Carbohydrates	76.9	77.4	78.1	77.3
Acid detergent fiber	2.82	2.83	3.34	2.83
Neutral detergent fiber	9.54	9.14	9.44	8.84
Vitamin E (mg/g)	0.00367	0.00379	0.00348	0.00409
Phytic acid (%)	0.710	0.753	0.886	0.920
Trypsin inhibitor (TIU/mg)	1.23	1.91	3.12	2.64
Minerals (ppm)				
Calcium	59.3	58.4	56.6	58.9
Copper	1.66	1.74	1.82	1.59
Iron	18.1	17.0	16.1	17.0
Magnesium	1070	1010	988	1040
Manganese	9.29	8.70	8.02	8.59
Phosphorus	3090	2880	2910	2970
Potassium	3370	3120	3130	3200
Sodium	<100	<100	<100	<100
Zinc	18.5	18.6	17.0	16.3

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-767	Europe-768	Europe-769	Europe-770
Sample Identifier	Ref2-FN11-G	Ref2-FN12-G	Ref2-FN13-G	Ref2-FN14-G
Covance LIMS	00406668	00406664	00406657	00406663
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.429	0.396	0.382	0.433
16:1 palmitoleic	0.00405	<0.00400	<0.00400	0.004
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0653	0.0604	0.0558	0.0652
18:1 oleic	1.11	1.05	0.997	1.13
18:2 linoleic	2.11	1.96	1.88	2.18
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0487	0.0442	0.0413	0.0460
20:0 arachidic	0.0147	0.0135	0.0128	0.0147
20:1 eicosenoic	0.0111	0.0106	0.00973	0.0115
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00648	0.00498	0.00457	0.00514

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-767	Europe-768	Europe-769	Europe-770
Sample Identifier	Ref2-FN11-G	Ref2-FN12-G	Ref2-FN13-G	Ref2-FN14-G
Covance LIMS	00406668	00406664	00406657	00406663
Amino Acids (mg/g)				
Aspartic Acid	6.06	5.96	5.61	5.79
Threonine	3.31	3.17	2.90	3.14
Serine	4.84	4.48	4.11	4.54
Glutamic Acid	18.4	17.9	16.6	16.9
Proline	9.09	8.95	8.36	8.35
Glycine	3.27	3.25	3.12	3.20
Alanine	7.37	7.20	6.74	6.84
Cystine	1.96	1.94	1.88	1.87
Valine	4.59	4.72	4.49	4.33
Methionine	1.81	1.75	1.79	1.80
Isoleucine	3.31	3.43	3.24	3.08
Leucine	12.7	12.4	11.5	11.6
Tyrosine	3.50	2.90	3.06	3.32
Phenylalanine	4.78	4.69	4.40	4.42
Histidine	2.71	2.69	2.59	2.54
Lysine	2.52	2.60	2.52	2.53
Arginine	3.88	3.67	3.53	4.15
Tryptophan	0.514	0.503	0.514	0.503

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-772	Europe-773	Europe-774
Sample Identifier	Ref3-FN12-G	Ref3-FN13-G	Ref3-FN14-G
Covance LIMS	00406651	00406654	00406665
Proximate (%)			
Protein	9.88	9.56	9.53
Moisture	8.19	8.66	8.37
Total Fat	3.87	3.57	3.65
Ash	1.47	1.38	1.37
Carbohydrates	76.6	76.8	77.1
Acid detergent fiber	2.60	3.00	2.74
Neutral detergent fiber	9.02	8.88	9.62
Vitamin E (mg/g)	0.00656	0.00650	0.00581
Phytic acid (%)	0.768	0.826	0.666
Trypsin inhibitor (TIU/mg)	1.88	1.99	2.13
Minerals (ppm)			
Calcium	48.2	49.6	47.0
Copper	1.63	1.74	1.52
Iron	16.3	16.6	15.4
Magnesium	1200	1170	1170
Manganese	6.94	7.03	7.10
Phosphorus	3360	3330	3340
Potassium	3560	3540	3550
Sodium	<100	<100	<100
Zinc	19.3	18.4	18.6

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-772	Europe-773	Europe-774
Sample Identifier	Ref3-FN12-G	Ref3-FN13-G	Ref3-FN14-G
Covance LIMS	00406651	00406654	00406665
Fatty Acids (%)			
8:0 caprylic	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.438	0.400	0.405
16:1 palmitoleic	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0576	0.0532	0.0563
18:1 oleic	1.02	0.949	0.976
18:2 linoleic	2.13	1.93	1.94
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0411	0.0383	0.0375
20:0 arachidic	0.0163	0.0153	0.0154
20:1 eicosenoic	0.0106	0.00984	0.0102
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00600	0.00578	0.00560

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-772	Europe-773	Europe-774
Sample Identifier	Ref3-FN12-G	Ref3-FN13-G	Ref3-FN14-G
Covance LIMS	00406651	00406654	00406665
Amino Acids (mg/g)			
Aspartic Acid	6.41	6.42	6.64
Threonine	3.38	3.30	3.39
Serine	4.82	4.58	4.76
Glutamic Acid	19.8	19.1	19.3
Proline	9.25	8.88	9.01
Glycine	3.42	3.48	3.72
Alanine	7.88	7.62	7.71
Cystine	2.02	1.92	1.79
Valine	4.96	4.88	5.00
Methionine	2.02	1.95	1.82
Isoleucine	3.73	3.56	3.61
Leucine	13.7	12.9	13.0
Tyrosine	3.17	3.70	3.69
Phenylalanine	5.25	5.05	5.12
Histidine	2.69	2.60	2.72
Lysine	2.70	2.86	2.99
Arginine	3.90	3.87	4.39
Tryptophan	0.565	0.551	0.588

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-776	Europe-777	Europe-778
Sample Identifier	Ref4-FN12-G	Ref4-FN13-G	Ref4-FN14-G
Covance LIMS	00406646	00406649	00406647
Proximate (%)			
Protein	9.66	9.39	9.35
Moisture	8.30	8.47	8.50
Total Fat	3.56	3.36	3.82
Ash	1.52	1.52	1.53
Carbohydrates	77.0	77.3	76.8
Acid detergent fiber	2.97	2.81	3.91
Neutral detergent fiber	8.82	10.6	9.56
Vitamin E (mg/g)	0.00341	0.00352	0.00347
Phytic acid (%)	0.902	0.874	0.874
Trypsin inhibitor (TIU/mg)	2.00	1.64	1.91
Minerals (ppm)			
Calcium	46.4	48.0	51.0
Copper	1.92	1.80	1.85
Iron	14.8	16.5	17.3
Magnesium	1080	1180	1200
Manganese	6.85	6.98	7.36
Phosphorus	3110	3400	3420
Potassium	3340	3620	3710
Sodium	<100	<100	<100
Zinc	19.0	18.8	19.4

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-776	Europe-777	Europe-778
Sample Identifier	Ref4-FN12-G	Ref4-FN13-G	Ref4-FN14-G
Covance LIMS	00406646	00406649	00406647
Fatty Acids (%)			
8:0 caprylic	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.392	0.375	0.421
16:1 palmitoleic	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0538	0.0500	0.0566
18:1 oleic	0.891	0.832	0.957
18:2 linoleic	1.92	1.83	2.10
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0361	0.0352	0.0401
20:0 arachidic	0.0149	0.0139	0.0155
20:1 eicosenoic	0.0104	0.00950	0.0107
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00582	0.00486	0.00560

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-776	Europe-777	Europe-778
Sample Identifier	Ref4-FN12-G	Ref4-FN13-G	Ref4-FN14-G
Covance LIMS	00406646	00406649	00406647
Amino Acids (mg/g)			
Aspartic Acid	6.27	6.18	5.96
Threonine	3.34	3.32	3.14
Serine	4.63	4.58	4.43
Glutamic Acid	18.9	18.5	18.0
Proline	8.88	8.98	8.37
Glycine	3.53	3.43	3.29
Alanine	7.53	7.38	7.19
Cystine	1.83	1.95	1.69
Valine	4.86	4.77	4.62
Methionine	1.81	1.89	1.74
Isoleucine	3.57	3.46	3.37
Leucine	12.8	12.5	12.3
Tyrosine	3.39	3.63	3.45
Phenylalanine	4.95	4.84	4.81
Histidine	2.73	2.65	2.52
Lysine	2.92	2.87	2.63
Arginine	4.11	4.16	3.87
Tryptophan	0.585	0.543	0.553

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-779	Europe-780	Europe-781	Europe-782
Sample Identifier	Ref5-FN11-G	Ref5-FN12-G	Ref5-FN13-G	Ref5-FN14-G
Covance LIMS	00406666	00406658	00406662	00406653
Proximate (%)				
Protein	9.71	9.48	9.53	10.6
Moisture	8.53	8.67	8.56	8.52
Total Fat	3.77	3.86	4.18	3.99
Ash	1.62	1.71	1.39	1.62
Carbohydrates	76.4	76.3	76.3	75.3
Acid detergent fiber	5.79	3.40	3.35	3.15
Neutral detergent fiber	11.4	9.85	9.08	11.0
Vitamin E (mg/g)	0.00460	0.00445	0.00377	0.00424
Phytic acid (%)	0.886	0.945	0.824	0.792
Trypsin inhibitor (TIU/mg)	1.08	3.77	2.38	2.19
Minerals (ppm)				
Calcium	50.0	51.3	48.8	50.5
Copper	1.56	1.62	1.62	1.54
Iron	19.1	18.2	18.5	19.5
Magnesium	1210	1130	1130	1220
Manganese	8.60	7.59	7.80	8.52
Phosphorus	3350	3260	3230	3290
Potassium	3500	3470	3380	3380
Sodium	<100	<100	<100	<100
Zinc	22.3	19.2	20.2	20.8

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-779	Europe-780	Europe-781	Europe-782
Sample Identifier	Ref5-FN11-G	Ref5-FN12-G	Ref5-FN13-G	Ref5-FN14-G
Covance LIMS	00406666	00406658	00406662	00406653
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.420	0.418	0.457	0.440
16:1 palmitoleic	0.00431	0.00411	0.00482	0.00477
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0650	0.0626	0.0709	0.0677
18:1 oleic	1.05	1.04	1.13	1.13
18:2 linoleic	2.00	2.01	2.18	2.08
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0396	0.0405	0.0437	0.0417
20:0 arachidic	0.0160	0.0164	0.0177	0.0170
20:1 eicosenoic	0.0103	0.0106	0.0115	0.0108
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00584	0.00651	0.00616	0.00609

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-1, Germignonville, France (Continued)

Monsanto ID	Europe-779	Europe-780	Europe-781	Europe-782
Sample Identifier	Ref5-FN11-G	Ref5-FN12-G	Ref5-FN13-G	Ref5-FN14-G
Covance LIMS	00406666	00406658	00406662	00406653
Amino Acids (mg/g)				
Aspartic Acid	6.38	7.00	6.02	6.60
Threonine	3.50	3.23	3.42	3.60
Serine	4.71	4.49	4.58	5.05
Glutamic Acid	19.8	19.7	18.8	21.2
Proline	9.55	9.40	9.15	10.2
Glycine	3.57	3.56	3.36	3.58
Alanine	7.84	7.61	7.42	8.42
Cystine	2.08	2.03	2.06	1.89
Valine	5.14	4.99	4.78	5.34
Methionine	1.92	1.93	1.91	1.79
Isoleucine	3.72	3.56	3.41	3.96
Leucine	13.5	13.0	12.9	14.7
Tyrosine	3.48	3.65	3.70	3.67
Phenylalanine	5.12	4.91	4.83	5.49
Histidine	2.85	2.77	2.69	2.97
Lysine	2.85	3.61	2.60	2.83
Arginine	4.04	3.76	3.80	3.99
Tryptophan	0.587	0.517	0.531	0.538

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France

Monsanto ID	Europe-811	Europe-812	Europe-813	Europe-814
Sample Identifier	NK603-FN21-G	NK603-FN22-G	NK603-FN23-G	NK603-FN24-G
Covance LIMS	00406688	00406684	00406683	00406690
Proximate (%)				
Protein	15.5	15.4	14.9	15.8
Moisture	7.44	7.59	7.46	8.07
Total Fat	3.53	3.45	3.51	3.64
Ash	2.07	2.07	1.88	2.16
Carbohydrates	71.5	71.5	72.3	70.3
Acid detergent fiber	3.45	3.53	3.21	5.07
Neutral detergent fiber	10.9	12.5	10.5	12.3
Vitamin E (mg/g)	0.00412	0.00445	0.00589	0.00487
Phytic acid (%)	0.987	0.801	0.942	0.986
Trypsin inhibitor (TIU/mg)	<1.0	<1.0	1.56	<1.0
Minerals (ppm)				
Calcium	86.8	88.0	78.3	95.0
Copper	1.78	1.75	1.62	1.88
Iron	21.7	22.4	20.7	21.3
Magnesium	1360	1410	1270	1400
Manganese	9.10	9.06	7.71	9.95
Phosphorus	3970	4190	3840	4180
Potassium	4980	5270	4460	5240
Sodium	<100	<100	<100	<100
Zinc	24.8	24.8	22.1	25.3

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-811	Europe-812	Europe-813	Europe-814
Sample Identifier	NK603-FN21-G	NK603-FN22-G	NK603-FN23-G	NK603-FN24-G
Covance LIMS	00406688	00406684	00406683	00406690
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.283	0.265	0.276	0.277
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0460	0.0429	0.0448	0.0445
18:1 oleic	0.702	0.652	0.679	0.705
18:2 linoleic	2.24	2.10	2.26	2.28
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0363	0.0337	0.0343	0.0352
20:0 arachidic	0.0129	0.0121	0.0124	0.0126
20:1 eicosenoic	0.0103	0.00960	0.0100	0.0102
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00528	0.00478	0.00536	0.00458

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-811	Europe-812	Europe-813	Europe-814
Sample Identifier	NK603-FN21-G	NK603-FN22-G	NK603-FN23-G	NK603-FN24-G
Covance LIMS	00406688	00406684	00406683	00406690
Amino Acids (mg/g)				
Aspartic Acid	11.0	10.8	10.5	11.0
Threonine	5.12	4.95	4.77	4.94
Serine	7.80	7.15	6.91	7.00
Glutamic Acid	32.0	31.9	30.5	32.5
Proline	13.9	13.6	13.9	14.4
Glycine	4.87	4.71	4.63	4.88
Alanine	12.7	12.5	12.0	12.9
Cystine	2.05	2.70	2.50	2.52
Valine	7.53	7.62	7.41	7.95
Methionine	2.54	3.11	2.81	2.87
Isoleucine	5.93	6.07	5.92	6.41
Leucine	22.5	22.5	21.7	23.0
Tyrosine	5.81	5.61	5.56	4.76
Phenylalanine	8.33	8.23	8.06	8.44
Histidine	3.80	3.80	3.76	3.88
Lysine	3.97	3.72	3.88	4.17
Arginine	5.89	5.59	5.61	5.51
Tryptophan	0.876	0.851	0.937	0.967

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-815	Europe-816	Europe-817	Europe-818
Sample Identifier	Control-FN21-G	Control-FN22-G	Control-FN23-G	Control-FN24-G
Covance LIMS	00406674	00406673	00406687	00406691
Proximate (%)				
Protein	14.8	13.6	15.5	14.0
Moisture	7.72	7.80	8.13	8.43
Total Fat	3.35	3.30	3.28	3.34
Ash	1.69	1.82	1.98	1.94
Carbohydrates	72.4	73.5	71.1	72.3
Acid detergent fiber	4.58	3.95	4.23	3.87
Neutral detergent fiber	17.1	15.7	13.5	13.5
Vitamin E (mg/g)	0.00573	0.00505	0.00511	0.00459
Phytic acid (%)	0.930	0.662	0.721	0.920
Trypsin inhibitor (TIU/mg)	1.01	1.13	1.26	1.28
Minerals (ppm)				
Calcium	73.8	88.6	94.5	103
Copper	1.74	1.77	1.63	1.50
Iron	19.3	21.7	21.7	22.8
Magnesium	1190	1140	1190	1120
Manganese	8.22	8.17	9.61	8.02
Phosphorus	3600	3530	3730	3550
Potassium	4360	4590	4870	4760
Sodium	<100	<100	<100	<100
Zinc	25.6	23.7	25.1	22.1

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-815	Europe-816	Europe-817	Europe-818
Sample Identifier	Control-FN21-G	Control-FN22-G	Control-FN23-G	Control-FN24-G
Covance LIMS	00406674	00406673	00406687	00406691
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.257	0.259	0.256	0.270
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0422	0.0409	0.0418	0.0422
18:1 oleic	0.665	0.646	0.625	0.690
18:2 linoleic	2.10	2.10	2.06	2.14
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0316	0.0321	0.0355	0.0322
20:0 arachidic	0.0110	0.0112	0.0115	0.0116
20:1 eicosenoic	0.00941	0.00956	0.00961	0.00978
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00435	0.00424	0.00506	0.00465

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-815	Europe-816	Europe-817	Europe-818
Sample Identifier	Control-FN21-G	Control-FN22-G	Control-FN23-G	Control-FN24-G
Covance LIMS	00406674	00406673	00406687	00406691
Amino Acids (mg/g)				
Aspartic Acid	10.1	9.77	11.1	9.53
Threonine	4.78	4.61	4.98	4.83
Serine	6.98	6.69	7.07	6.88
Glutamic Acid	31.4	29.3	32.5	27.9
Proline	14.0	13.1	15.0	12.7
Glycine	4.65	4.58	4.95	4.60
Alanine	12.3	11.6	12.8	11.0
Cystine	2.63	2.52	2.71	2.42
Valine	7.45	7.06	7.86	6.52
Methionine	2.76	2.66	2.88	2.54
Isoleucine	5.96	5.63	6.36	5.09
Leucine	22.1	20.6	22.9	19.5
Tyrosine	5.70	4.71	5.90	5.17
Phenylalanine	8.07	7.57	8.55	7.27
Histidine	3.81	3.67	3.98	3.58
Lysine	3.79	3.78	4.11	3.77
Arginine	5.59	5.33	5.87	5.50
Tryptophan	0.830	0.763	0.836	0.740

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-819	Europe-820	Europe-821	Europe-822
Sample Identifier	Refl-FN21-G	Refl-FN22-G	Refl-FN23-G	Refl-FN24-G
Covance LIMS	00406678	00406679	00406669	00406671
Proximate (%)				
Protein	9.69	9.16	9.60	10.1
Moisture	7.90	9.05	8.64	8.66
Total Fat	4.22	4.30	4.28	4.20
Ash	1.63	1.57	1.59	1.54
Carbohydrates	76.6	75.9	75.9	75.5
Acid detergent fiber	2.56	2.63	2.91	2.98
Neutral detergent fiber	9.01	8.49	8.59	8.94
Vitamin E (mg/g)	0.00394	0.00324	0.00381	0.00490
Phytic acid (%)	0.684	0.665	0.780	0.700
Trypsin inhibitor (TIU/mg)	1.63	1.79	1.30	1.16
Minerals (ppm)				
Calcium	54.5	49.7	56.5	51.8
Copper	1.63	1.60	1.70	1.62
Iron	24.8	25.5	25.4	26.8
Magnesium	1100	1060	1130	1190
Manganese	8.80	7.95	9.07	9.56
Phosphorus	3250	3170	3360	3500
Potassium	3440	3350	3520	3640
Sodium	<100	<100	<100	<100
Zinc	18.9	16.7	18.9	18.9

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-819	Europe-820	Europe-821	Europe-822
Sample Identifier	Refl-FN21-G	Refl-FN22-G	Refl-FN23-G	Refl-FN24-G
Covance LIMS	00406678	00406679	00406669	00406671
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.443	0.444	0.455	0.441
16:1 palmitoleic	0.00437	0.0041	0.00422	0.00422
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0677	0.0666	0.0679	0.0657
18:1 oleic	1.15	1.12	1.15	1.12
18:2 linoleic	2.13	2.02	2.28	2.21
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0455	0.0402	0.0488	0.0488
20:0 arachidic	0.0145	0.0143	0.0145	0.0141
20:1 eicosenoic	0.0109	0.0125	0.0112	0.0109
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00545	0.00546	0.00483	0.00490

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-819	Europe-820	Europe-821	Europe-822
Sample Identifier	Refl-FN21-G	Refl-FN22-G	Refl-FN23-G	Refl-FN24-G
Covance LIMS	00406678	00406679	00406669	00406671
Amino Acids (mg/g)				
Aspartic Acid	6.20	5.75	6.01	6.71
Threonine	3.29	3.07	3.21	3.48
Serine	4.54	4.25	4.47	4.92
Glutamic Acid	19.2	17.9	18.2	20.8
Proline	9.64	8.94	9.23	10.2
Glycine	3.34	3.17	3.28	3.50
Alanine	7.72	7.28	7.33	8.27
Cystine	1.85	1.94	1.83	2.03
Valine	5.00	4.73	4.78	5.15
Methionine	1.86	1.93	1.75	2.04
Isoleucine	3.69	3.51	3.47	3.80
Leucine	13.4	12.7	12.5	14.3
Tyrosine	3.41	3.35	3.33	3.86
Phenylalanine	4.99	4.67	4.73	5.32
Histidine	2.81	2.68	2.74	2.89
Lysine	2.68	2.50	2.72	2.70
Arginine	3.87	3.63	3.87	4.04
Tryptophan	0.561	0.531	0.509	0.512

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-823	Europe-824	Europe-825	Europe-826
Sample Identifier	Ref2-FN21-G	Ref2-FN22-G	Ref2-FN23-G	Ref2-FN24-G
Covance LIMS	00406696	00406672	00406686	00406682
Proximate (%)				
Protein	9.95	10.7	9.33	10.7
Moisture	8.04	8.89	9.53	8.43
Total Fat	3.62	3.46	3.49	3.65
Ash	1.59	1.62	1.73	1.78
Carbohydrates	76.8	75.3	75.9	75.4
Acid detergent fiber	3.46	3.50	3.16	2.84
Neutral detergent fiber	9.27	9.90	10.2	10.3
Vitamin E (mg/g)	0.0120	0.0129	0.0124	0.0125
Phytic acid (%)	0.649	0.677	0.645	0.597
Trypsin inhibitor (TIU/mg)	1.50	<1.0	<1.0	1.21
Minerals (ppm)				
Calcium	61.3	63.5	66.9	61.7
Copper	1.29	1.36	1.28	1.24
Iron	21.8	20.3	20.4	21.9
Magnesium	1070	1140	1060	1100
Manganese	6.11	6.98	6.22	6.79
Phosphorus	3190	3360	3260	3240
Potassium	3540	3610	3760	3500
Sodium	<100	<100	<100	<100
Zinc	16.5	17.5	15.7	16.4

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-823	Europe-824	Europe-825	Europe-826
Sample Identifier	Ref2-FN21-G	Ref2-FN22-G	Ref2-FN23-G	Ref2-FN24-G
Covance LIMS	00406696	00406672	00406686	00406682
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.324	0.309	0.312	0.321
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0600	0.0559	0.0547	0.0573
18:1 oleic	0.905	0.868	0.832	0.881
18:2 linoleic	2.03	1.96	1.95	2.02
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0435	0.0412	0.0425	0.0434
20:0 arachidic	0.0126	0.0121	0.0125	0.0119
20:1 eicosenoic	0.0105	0.00979	0.0103	0.00980
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00467	0.00454	0.00463	0.00459

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-823	Europe-824	Europe-825	Europe-826
Sample Identifier	Ref2-FN21-G	Ref2-FN22-G	Ref2-FN23-G	Ref2-FN24-G
Covance LIMS	00406696	00406672	00406686	00406682
Amino Acids (mg/g)				
Aspartic Acid	7.18	7.10	6.03	6.83
Threonine	3.43	3.76	3.13	3.62
Serine	4.62	5.27	4.11	4.98
Glutamic Acid	20.8	21.6	17.3	21.1
Proline	9.70	10.1	8.76	10.3
Glycine	3.79	3.77	3.34	3.68
Alanine	7.97	8.54	6.94	8.44
Cystine	2.08	2.19	1.97	2.19
Valine	5.13	5.42	4.68	5.41
Methionine	2.08	2.17	1.99	2.43
Isoleucine	3.77	4.04	3.45	4.12
Leucine	13.6	14.8	11.9	14.9
Tyrosine	3.65	4.19	3.36	4.15
Phenylalanine	5.17	5.61	4.57	5.61
Histidine	2.78	2.95	2.54	2.98
Lysine	3.22	3.05	2.87	3.04
Arginine	4.05	4.35	3.83	4.30
Tryptophan	0.554	0.606	0.631	0.628

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-827	Europe-828	Europe-829	Europe-830
Sample Identifier	Ref3-FN21-G	Ref3-FN22-G	Ref3-FN23-G	Ref3-FN24-G
Covance LIMS	00406692	00406680	00406693	00406676
Proximate (%)				
Protein	10.6	10.3	9.60	9.75
Moisture	8.09	7.82	8.44	8.47
Total Fat	3.89	4.15	4.35	3.94
Ash	1.62	1.46	1.57	1.59
Carbohydrates	75.8	76.3	76.0	76.3
Acid detergent fiber	2.88	2.86	2.98	2.85
Neutral detergent fiber	10.4	10.7	9.29	13.5
Vitamin E (mg/g)	0.00424	0.00413	0.00497	0.00379
Phytic acid (%)	0.727	0.595	0.664	0.699
Trypsin inhibitor (TIU/mg)	1.51	1.17	2.34	1.45
Minerals (ppm)				
Calcium	43.2	42.6	42.8	42.0
Copper	1.09	1.07	1.16	1.17
Iron	22.2	21.9	22.2	23.2
Magnesium	1380	1330	1230	1250
Manganese	7.75	6.75	6.57	6.91
Phosphorus	3310	3220	3040	3110
Potassium	3610	3510	3390	3640
Sodium	<100	<100	<100	<100
Zinc	20.0	18.0	16.4	17.4

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-827	Europe-828	Europe-829	Europe-830
Sample Identifier	Ref3-FN21-G	Ref3-FN22-G	Ref3-FN23-G	Ref3-FN24-G
Covance LIMS	00406692	00406680	00406693	00406676
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.438	0.451	0.488	0.432
16:1 palmitoleic	0.00501	0.00489	0.00553	0.00479
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0703	0.0696	0.0765	0.0676
18:1 oleic	1.25	1.25	1.37	1.21
18:2 linoleic	1.86	1.90	2.10	1.83
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0415	0.0416	0.0462	0.0396
20:0 arachidic	0.0174	0.0176	0.0191	0.0172
20:1 eicosenoic	0.0114	0.0116	0.0126	0.0114
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00574	0.00565	0.00635	0.00565

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-827	Europe-828	Europe-829	Europe-830
Sample Identifier	Ref3-FN21-G	Ref3-FN22-G	Ref3-FN23-G	Ref3-FN24-G
Covance LIMS	00406692	00406680	00406693	00406676
Amino Acids (mg/g)				
Aspartic Acid	6.78	6.66	6.41	6.46
Threonine	3.61	3.40	3.35	3.42
Serine	4.95	4.68	4.56	4.58
Glutamic Acid	20.3	19.7	18.1	18.7
Proline	10.2	9.82	8.91	9.27
Glycine	3.71	3.64	3.68	3.65
Alanine	8.15	7.91	7.42	7.63
Cystine	2.07	2.07	1.92	1.93
Valine	5.25	5.31	5.00	5.06
Methionine	2.37	2.30	2.13	2.07
Isoleucine	3.80	3.80	3.48	3.72
Leucine	13.8	13.5	12.0	12.8
Tyrosine	3.89	3.55	3.46	2.49
Phenylalanine	5.27	5.25	4.78	4.99
Histidine	2.84	2.87	2.68	2.78
Lysine	3.02	3.09	3.06	3.14
Arginine	4.43	4.37	4.39	4.03
Tryptophan	0.609	0.663	0.606	0.626

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-831	Europe-832	Europe-833	Europe-834
Sample Identifier	Ref4-FN21-G	Ref4-FN22-G	Ref4-FN23-G	Ref4-FN24-G
Covance LIMS	00406677	00406685	00406681	00406670
Proximate (%)				
Protein	9.08	9.60	8.74	9.82
Moisture	8.56	8.50	9.61	9.00
Total Fat	3.14	2.96	2.89	2.99
Ash	1.51	1.64	1.64	1.50
Carbohydrates	77.7	77.3	77.1	76.7
Acid detergent fiber	3.07	3.10	2.66	2.97
Neutral detergent fiber	10.5	9.58	10.9	9.49
Vitamin E (mg/g)	0.00348	0.00246	0.00360	0.00359
Phytic acid (%)	0.773	0.718	0.866	0.694
Trypsin inhibitor (TIU/mg)	1.27	1.41	1.07	1.13
Minerals (ppm)				
Calcium	61.0	61.6	54.1	68.8
Copper	2.45	2.31	2.07	2.53
Iron	23.7	22.8	21.0	26.0
Magnesium	1180	1120	951	1200
Manganese	5.00	5.71	4.52	6.54
Phosphorus	3530	3360	2940	3580
Potassium	4020	3930	3300	4070
Sodium	<100	<100	<100	<100
Zinc	19.0	19.6	15.3	21.6

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-831	Europe-832	Europe-833	Europe-834
Sample Identifier	Ref4-FN21-G	Ref4-FN22-G	Ref4-FN23-G	Ref4-FN24-G
Covance LIMS	00406677	00406685	00406681	00406670
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.334	0.320	0.305	0.316
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0454	0.0425	0.0434	0.0433
18:1 oleic	0.639	0.581	0.608	0.597
18:2 linoleic	1.80	1.72	1.66	1.71
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0387	0.0409	0.0362	0.0365
20:0 arachidic	0.0116	0.0114	0.0110	0.0113
20:1 eicosenoic	0.00955	0.00924	0.00882	0.00914
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00444	<0.00400	0.00463	0.00416

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-831	Europe-832	Europe-833	Europe-834
Sample Identifier	Ref4-FN21-G	Ref4-FN22-G	Ref4-FN23-G	Ref4-FN24-G
Covance LIMS	00406677	00406685	00406681	00406670
Amino Acids (mg/g)				
Aspartic Acid	6.02	6.81	6.22	6.89
Threonine	3.11	3.43	3.15	3.40
Serine	4.20	4.65	4.15	4.76
Glutamic Acid	17.5	19.8	17.1	20.4
Proline	8.66	9.79	8.12	9.29
Glycine	3.23	3.50	3.35	3.49
Alanine	7.22	8.06	6.94	8.11
Cystine	1.63	1.80	1.72	1.79
Valine	4.70	5.23	4.62	5.17
Methionine	1.79	1.85	1.76	1.97
Isoleucine	3.45	3.86	3.36	3.83
Leucine	12.3	13.6	11.6	13.7
Tyrosine	3.37	3.67	3.19	3.59
Phenylalanine	4.75	5.19	4.50	5.21
Histidine	2.52	2.68	2.47	2.69
Lysine	2.70	3.00	2.92	3.01
Arginine	3.77	4.01	3.95	3.89
Tryptophan	0.627	0.582	0.548	0.541

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-835	Europe-836	Europe-837	Europe-838
Sample Identifier	Ref5-FN21-G	Ref5-FN22-G	Ref5-FN23-G	Ref5-FN24-G
Covance LIMS	00406694	00406675	00406695	00406689
Proximate (%)				
Protein	10.4	9.49	10.2	10.4
Moisture	8.60	9.26	8.71	8.74
Total Fat	4.09	4.11	4.52	4.22
Ash	1.68	1.56	1.55	1.64
Carbohydrates	75.2	75.6	75.0	75.0
Acid detergent fiber	3.30	2.95	3.09	2.94
Neutral detergent fiber	9.03	10.8	8.75	9.50
Vitamin E (mg/g)	0.00362	0.00301	0.00415	0.00312
Phytic acid (%)	0.665	0.840	0.722	0.936
Trypsin inhibitor (TIU/mg)	1.46	1.06	1.79	<1.0
Minerals (ppm)				
Calcium	42.3	48.8	45.2	47.9
Copper	1.96	2.23	2.06	2.06
Iron	21.7	23.5	22.7	23.1
Magnesium	1160	1200	1150	1230
Manganese	6.28	6.50	6.45	6.91
Phosphorus	3250	3490	3270	3450
Potassium	3460	3950	3550	3700
Sodium	<100	<100	<100	<100
Zinc	20.1	20.6	19.3	21.6

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-835	Europe-836	Europe-837	Europe-838
Sample Identifier	Ref5-FN21-G	Ref5-FN22-G	Ref5-FN23-G	Ref5-FN24-G
Covance LIMS	00406694	00406675	00406695	00406689
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.434	0.444	0.479	0.450
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0751	0.0763	0.0808	0.0786
18:1 oleic	1.32	1.31	1.41	1.34
18:2 linoleic	1.97	1.88	2.11	2.00
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0301	0.0270	0.0337	0.0312
20:0 arachidic	0.0220	0.0224	0.0238	0.0233
20:1 eicosenoic	0.0143	0.0137	0.0151	0.0147
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00663	0.00783	0.00727	0.00725

Table 2 (Continued)
Grain Compositional Analyses

Site: FN-2, Janville, France (Continued)

Monsanto ID	Europe-835	Europe-836	Europe-837	Europe-838
Sample Identifier	Ref5-FN21-G	Ref5-FN22-G	Ref5-FN23-G	Ref5-FN24-G
Covance LIMS	00406694	00406675	00406695	00406689
Amino Acids (mg/g)				
Aspartic Acid	7.02	6.21	6.71	6.76
Threonine	3.68	3.26	3.53	3.47
Serine	5.05	4.38	4.83	4.64
Glutamic Acid	21.2	18.4	20.2	20.8
Proline	10.2	9.09	9.97	9.99
Glycine	3.83	3.49	3.68	3.63
Alanine	8.38	7.36	8.08	8.28
Cystine	2.17	1.91	1.98	1.98
Valine	5.36	4.83	5.18	5.36
Methionine	2.23	2.06	2.05	2.15
Isoleucine	3.92	3.49	3.73	3.93
Leucine	14.3	12.6	13.7	14.3
Tyrosine	3.73	3.65	3.84	4.11
Phenylalanine	5.44	4.84	5.24	5.42
Histidine	3.00	2.69	2.82	2.85
Lysine	3.16	2.85	2.91	2.85
Arginine	4.58	4.13	4.32	4.20
Tryptophan	0.630	0.595	0.571	0.603

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France

Monsanto ID	Europe-868	Europe-869	Europe-870	Europe-871
Sample Identifier	NK603-FS31-G	NK603-FS32-G	NK603-FS33-G	NK603-FS34-G
Covance LIMS	00406709	00406698	00406699	00406700
Proximate (%)				
Protein	9.45	9.57	9.91	9.85
Moisture	7.65	7.82	7.53	7.81
Total Fat	3.65	3.69	4.05	4.13
Ash	1.15	1.52	1.15	1.26
Carbohydrates	78.1	77.4	77.4	77.0
Acid detergent fiber	2.73	2.42	2.65	3.45
Neutral detergent fiber	10.6	7.84	8.21	7.84
Vitamin E (mg/g)	0.00442	0.00503	0.00489	0.00538
Phytic acid (%)	0.782	0.733	0.693	0.822
Trypsin inhibitor (TIU/mg)	<1.0	1.41	<1.0	<1.0
Minerals (ppm)				
Calcium	47.9	47.9	48.0	45.9
Copper	1.63	1.81	1.74	1.83
Iron	16.1	19.5	18.4	18.0
Magnesium	886	1030	997	1050
Manganese	4.78	5.53	5.61	5.44
Phosphorus	2830	3280	3040	3290
Potassium	3150	3390	3200	3360
Sodium	<100	<100	<100	<100
Zinc	16.1	14.7	18.0	16.9

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'lsle Jourdain, France (Continued)

Monsanto ID	Europe-868	Europe-869	Europe-870	Europe-871
Sample Identifier	NK603-FS31-G	NK603-FS32-G	NK603-FS33-G	NK603-FS34-G
Covance LIMS	00406709	00406698	00406699	00406700
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.292	0.299	0.332	0.322
16:1 palmitoleic	<0.00400	<0.00400	0.00405	0.00411
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0548	0.0571	0.0622	0.0600
18:1 oleic	0.775	0.809	0.885	0.872
18:2 linoleic	2.19	2.30	2.53	2.45
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0345	0.0365	0.0382	0.0384
20:0 arachidic	0.0121	0.0123	0.0134	0.0130
20:1 eicosenoic	0.00972	0.0104	0.0116	0.0105
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00544	0.00504	0.00512	0.00471

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'lsle Jourdain, France (Continued)

Monsanto ID	Europe-868	Europe-869	Europe-870	Europe-871
Sample Identifier	NK603-FS31-G	NK603-FS32-G	NK603-FS33-G	NK603-FS34-G
Covance LIMS	00406709	00406698	00406699	00406700
Amino Acids (mg/g)				
Aspartic Acid	6.24	6.34	7.35	6.28
Threonine	3.44	3.19	3.32	3.22
Serine	4.99	4.49	4.72	4.55
Glutamic Acid	18.3	19.7	21.2	18.8
Proline	9.17	9.55	10.0	9.25
Glycine	3.51	3.36	3.81	3.48
Alanine	7.72	7.96	8.57	7.78
Cystine	1.91	1.74	1.96	1.93
Valine	4.58	4.92	5.23	4.88
Methionine	1.78	1.63	1.85	1.81
Isoleucine	3.41	3.81	3.93	3.73
Leucine	12.9	13.8	14.4	13.3
Tyrosine	3.50	3.19	3.10	3.54
Phenylalanine	4.95	5.17	5.46	5.08
Histidine	2.64	2.59	2.77	2.63
Lysine	2.71	2.68	3.20	2.80
Arginine	4.08	3.68	4.03	4.15
Tryptophan	0.600	0.542	0.670	0.606

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-872	Europe-873	Europe-874
Sample Identifier	Control-FS31-G	Control-FS32-G	Control-FS33-G
Covance LIMS	00406717	00406721	00406720
Proximate (%)			
Protein	9.37	9.65	9.34
Moisture	8.28	7.68	7.79
Total Fat	3.44	3.12	3.54
Ash	1.15	1.15	1.17
Carbohydrates	77.8	78.4	78.2
Acid detergent fiber	2.17	2.12	2.86
Neutral detergent fiber	8.58	9.07	10.1
Vitamin E (mg/g)	0.00530	0.00513	0.00544
Phytic acid (%)	0.652	0.647	0.510
Trypsin inhibitor (TIU/mg)	<1.0	1.89	<1.0
Minerals (ppm)			
Calcium	52.7	46.0	46.4
Copper	1.76	1.56	1.68
Iron	17.2	17.1	18.1
Magnesium	938	920	1030
Manganese	5.29	5.20	5.35
Phosphorus	3000	2960	3340
Potassium	3330	3300	3620
Sodium	<100	<100	<100
Zinc	16.4	16.5	16.6

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-872	Europe-873	Europe-874
Sample Identifier	Control-FS31-G	Control-FS32-G	Control-FS33-G
Covance LIMS	00406717	00406721	00406720
Fatty Acids (%)			
8:0 caprylic	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.289	0.247	0.295
16:1 palmitoleic	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0542	0.0456	0.0560
18:1 oleic	0.764	0.643	0.796
18:2 linoleic	2.08	1.72	2.11
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0343	0.0283	0.0354
20:0 arachidic	0.0112	0.00899	0.0113
20:1 eicosenoic	0.00943	0.00755	0.00947
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00565	0.00479	0.00514

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-872	Europe-873	Europe-874
Sample Identifier	Control-FS31-G	Control-FS32-G	Control-FS33-G
Covance LIMS	00406717	00406721	00406720
Amino Acids (mg/g)			
Aspartic Acid	5.73	6.15	5.95
Threonine	3.20	3.24	3.10
Serine	4.66	4.86	4.63
Glutamic Acid	17.4	18.6	17.6
Proline	8.49	9.16	8.69
Glycine	3.29	3.55	3.55
Alanine	7.31	7.92	7.53
Cystine	1.73	1.93	1.86
Valine	4.34	4.90	4.75
Methionine	1.71	1.87	1.74
Isoleucine	3.30	3.66	3.52
Leucine	12.6	13.4	12.5
Tyrosine	3.34	3.60	3.39
Phenylalanine	4.80	5.20	4.91
Histidine	2.54	2.77	2.68
Lysine	2.56	2.85	3.01
Arginine	3.89	4.11	4.11
Tryptophan	0.592	0.579	0.650

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-876	Europe-877	Europe-878	Europe-879
Sample Identifier	Refl-FS31-G	Refl-FS32-G	Refl-FS33-G	Refl-FS34-G
Covance LIMS	00406714	00406707	00406704	00406722
Proximate (%)				
Protein	8.95	8.95	8.85	8.42
Moisture	8.50	8.58	8.52	8.43
Total Fat	3.22	3.49	3.35	3.75
Ash	1.16	1.32	1.09	1.31
Carbohydrates	78.2	77.7	78.2	78.1
Acid detergent fiber	3.26	2.87	2.26	2.75
Neutral detergent fiber	9.11	9.13	7.73	10.7
Vitamin E (mg/g)	0.00640	0.00647	0.00608	0.00600
Phytic acid (%)	0.671	0.529	0.655	0.601
Trypsin inhibitor (TIU/mg)	<1.0	<1.0	<1.0	<1.0
Minerals (ppm)				
Calcium	39.0	36.1	36.9	38.3
Copper	1.73	1.54	1.58	1.73
Iron	17.6	16.6	17.2	16.5
Magnesium	956	947	941	818
Manganese	5.12	5.57	5.38	4.85
Phosphorus	3050	2990	3050	2660
Potassium	3440	3380	3540	3190
Sodium	<100	<100	<100	<100
Zinc	15.0	14.3	15.6	15.0

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-876	Europe-877	Europe-878	Europe-879
Sample Identifier	Refl-FS31-G	Refl-FS32-G	Refl-FS33-G	Refl-FS34-G
Covance LIMS	00406714	00406707	00406704	00406722
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.286	0.327	0.300	0.330
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0428	0.0505	0.0470	0.0539
18:1 oleic	0.780	0.907	0.852	0.909
18:2 linoleic	1.87	2.11	1.93	2.02
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0314	0.0350	0.0317	0.0325
20:0 arachidic	0.0113	0.0123	0.0109	0.0125
20:1 eicosenoic	0.0105	0.0121	0.0102	0.0113
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00505	0.00540	0.00471	0.00677

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-876	Europe-877	Europe-878	Europe-879
Sample Identifier	Refl-FS31-G	Refl-FS32-G	Refl-FS33-G	Refl-FS34-G
Covance LIMS	00406714	00406707	00406704	00406722
Amino Acids (mg/g)				
Aspartic Acid	6.29	6.34	6.01	5.51
Threonine	3.03	3.01	3.00	2.80
Serine	4.43	4.34	4.28	4.20
Glutamic Acid	17.7	16.9	16.7	15.2
Proline	8.28	8.08	8.32	7.55
Glycine	3.30	3.33	3.29	3.02
Alanine	7.26	7.14	7.13	6.58
Cystine	1.58	1.67	1.85	1.71
Valine	4.58	4.48	4.51	4.05
Methionine	1.74	1.64	1.69	1.65
Isoleucine	3.19	3.09	3.09	2.75
Leucine	11.9	11.2	11.2	10.4
Tyrosine	3.23	3.15	2.94	2.90
Phenylalanine	4.58	4.38	4.29	4.03
Histidine	2.67	2.61	2.53	2.35
Lysine	2.88	3.00	2.74	2.49
Arginine	4.18	4.02	3.94	3.53
Tryptophan	0.585	0.591	0.536	0.639

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-880	Europe-881	Europe-882	Europe-883
Sample Identifier	Ref2-FS31-G	Ref2-FS32-G	Ref2-FS33-G	Ref2-FS34-G
Covance LIMS	00406712	00406713	00406723	00406706
Proximate (%)				
Protein	7.66	7.13	7.52	7.49
Moisture	7.92	8.20	8.54	8.18
Total Fat	2.78	2.77	2.88	2.45
Ash	1.14	1.17	1.10	0.947
Carbohydrates	80.5	80.7	80.0	80.9
Acid detergent fiber	2.60	2.34	2.25	2.68
Neutral detergent fiber	8.93	9.10	8.53	9.65
Vitamin E (mg/g)	0.0132	0.0124	0.0106	0.0116
Phytic acid (%)	0.609	0.502	0.459	0.441
Trypsin inhibitor (TIU/mg)	<1.0	<1.0	1.06	<1.0
Minerals (ppm)				
Calcium	43.9	45.5	47.4	46.8
Copper	1.37	1.42	1.60	1.35
Iron	15.1	14.7	14.1	14.8
Magnesium	902	900	925	836
Manganese	3.81	3.54	3.79	3.90
Phosphorus	2620	2720	2750	2490
Potassium	2980	3280	3330	3050
Sodium	129	<100	<100	<100
Zinc	13.9	12.4	13.5	15.8

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'lsle Jourdain, France (Continued)

Monsanto ID	Europe-880	Europe-881	Europe-882	Europe-883
Sample Identifier	Ref2-FS31-G	Ref2-FS32-G	Ref2-FS33-G	Ref2-FS34-G
Covance LIMS	00406712	00406713	00406723	00406706
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.295	0.297	0.328	0.266
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0317	0.0307	0.0367	0.0279
18:1 oleic	0.629	0.614	0.699	0.554
18:2 linoleic	1.57	1.58	1.69	1.41
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0353	0.0345	0.0375	0.0310
20:0 arachidic	0.00835	0.00808	0.00901	0.00706
20:1 eicosenoic	0.00708	0.00710	0.00756	0.00609
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00431	0.00410	0.00462	<0.00400

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-880	Europe-881	Europe-882	Europe-883
Sample Identifier	Ref2-FS31-G	Ref2-FS32-G	Ref2-FS33-G	Ref2-FS34-G
Covance LIMS	00406712	00406713	00406723	00406706
Amino Acids (mg/g)				
Aspartic Acid	5.15	5.41	5.31	5.12
Threonine	2.68	2.70	2.64	2.51
Serine	3.80	3.61	3.59	3.35
Glutamic Acid	14.0	14.0	13.8	13.5
Proline	6.95	6.57	6.72	6.75
Glycine	2.92	2.95	2.98	2.91
Alanine	6.03	5.78	5.89	5.82
Cystine	1.55	1.45	1.66	1.83
Valine	3.79	3.61	3.81	3.80
Methionine	1.44	1.46	1.43	1.63
Isoleucine	2.71	2.47	2.72	2.65
Leucine	9.72	9.02	9.19	8.94
Tyrosine	2.81	2.71	2.12	2.38
Phenylalanine	3.85	3.61	3.66	3.58
Histidine	2.24	2.14	2.19	2.08
Lysine	2.54	2.72	2.70	2.58
Arginine	3.43	3.42	3.30	3.14
Tryptophan	0.515	0.426	0.513	0.438

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-884	Europe-885	Europe-886	Europe-887
Sample Identifier	Ref3-FS31-G	Ref3-FS32-G	Ref3-FS33-G	Ref3-FS34-G
Covance LIMS	00406719	00406701	00406711	00406718
Proximate (%)				
Protein	10.9	10.6	10.9	10.5
Moisture	7.79	8.10	7.97	8.18
Total Fat	3.26	3.31	3.14	3.27
Ash	1.28	1.29	1.13	1.19
Carbohydrates	76.8	76.7	76.9	76.9
Acid detergent fiber	2.47	3.15	2.78	2.62
Neutral detergent fiber	8.48	8.73	9.00	8.44
Vitamin E (mg/g)	0.00649	0.00474	0.00479	0.00600
Phytic acid (%)	0.872	0.609	0.492	0.601
Trypsin inhibitor (TIU/mg)	<1.0	1.25	<1.0	1.10
Minerals (ppm)				
Calcium	53.1	47.2	49.3	53.6
Copper	2.40	2.07	2.29	2.55
Iron	26.9	23.9	23.0	21.9
Magnesium	1210	1020	1170	1130
Manganese	6.20	5.52	6.05	6.23
Phosphorus	3540	3000	3440	3300
Potassium	3610	3100	3420	3430
Sodium	<100	<100	<100	<100
Zinc	18.2	16.6	19.0	21.1

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-884	Europe-885	Europe-886	Europe-887
Sample Identifier	Ref3-FS31-G	Ref3-FS32-G	Ref3-FS33-G	Ref3-FS34-G
Covance LIMS	00406719	00406701	00406711	00406718
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.373	0.346	0.352	0.379
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0509	0.0440	0.0449	0.0513
18:1 oleic	0.779	0.731	0.737	0.786
18:2 linoleic	1.79	1.71	1.74	1.81
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0313	0.0302	0.0316	0.0323
20:0 arachidic	0.0140	0.0129	0.0132	0.0140
20:1 eicosenoic	0.0102	0.0101	0.0101	0.0105
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00666	0.00498	0.00565	0.00610

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-884	Europe-885	Europe-886	Europe-887
Sample Identifier	Ref3-FS31-G	Ref3-FS32-G	Ref3-FS33-G	Ref3-FS34-G
Covance LIMS	00406719	00406701	00406711	00406718
Amino Acids (mg/g)				
Aspartic Acid	6.62	6.97	6.95	6.78
Threonine	3.49	3.58	3.54	3.61
Serine	5.40	4.95	5.31	5.52
Glutamic Acid	20.8	21.0	21.1	20.5
Proline	9.85	10.2	10.1	9.93
Glycine	3.49	3.64	3.53	3.52
Alanine	8.56	8.47	8.65	8.31
Cystine	1.97	2.06	1.97	1.93
Valine	5.15	5.37	5.21	4.92
Methionine	2.09	2.04	1.98	2.08
Isoleucine	3.97	4.07	4.00	3.76
Leucine	15.2	14.9	15.3	14.8
Tyrosine	3.91	3.51	3.31	3.92
Phenylalanine	5.87	5.73	5.95	5.78
Histidine	2.83	2.83	2.86	2.83
Lysine	2.80	2.90	2.97	2.84
Arginine	4.18	4.33	4.08	4.15
Tryptophan	0.638	0.621	0.629	0.652

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-888	Europe-889	Europe-890	Europe-891
Sample Identifier	Ref4-FS31-G	Ref4-FS32-G	Ref4-FS33-G	Ref4-FS34-G
Covance LIMS	00406705	00406715	00406703	00406710
Proximate (%)				
Protein	7.89	7.88	7.96	8.34
Moisture	7.66	8.07	7.62	7.88
Total Fat	2.70	3.09	2.91	2.87
Ash	1.23	1.31	1.34	1.24
Carbohydrates	80.5	79.7	80.2	79.7
Acid detergent fiber	3.04	2.38	3.02	3.09
Neutral detergent fiber	10.5	9.65	10.7	9.19
Vitamin E (mg/g)	0.00931	0.0104	0.00868	0.0101
Phytic acid (%)	0.736	0.486	0.485	0.504
Trypsin inhibitor (TIU/mg)	<1.0	1.49	<1.0	<1.0
Minerals (ppm)				
Calcium	53.9	54.1	54.7	51.9
Copper	1.65	1.74	1.76	1.64
Iron	19.5	18.0	20.4	16.9
Magnesium	875	935	888	910
Manganese	5.27	6.35	5.68	5.74
Phosphorus	2830	3030	2910	2960
Potassium	3830	3820	3810	3920
Sodium	<100	<100	<100	<100
Zinc	13.7	15.8	14.9	17.5

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-888	Europe-889	Europe-890	Europe-891
Sample Identifier	Ref4-FS31-G	Ref4-FS32-G	Ref4-FS33-G	Ref4-FS34-G
Covance LIMS	00406705	00406715	00406703	00406710
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.245	0.293	0.262	0.255
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0472	0.0594	0.0499	0.0486
18:1 oleic	0.524	0.628	0.566	0.552
18:2 linoleic	1.63	1.97	1.81	1.76
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0283	0.0340	0.0322	0.0319
20:0 arachidic	0.00990	0.0118	0.0104	0.0104
20:1 eicosenoic	0.00759	0.00928	0.00805	0.00856
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00525	0.00624	0.00475	0.00514

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-888	Europe-889	Europe-890	Europe-891
Sample Identifier	Ref4-FS31-G	Ref4-FS32-G	Ref4-FS33-G	Ref4-FS34-G
Covance LIMS	00406705	00406715	00406703	00406710
Amino Acids (mg/g)				
Aspartic Acid	5.67	5.81	5.60	6.46
Threonine	2.65	2.81	2.72	3.05
Serine	3.51	3.94	3.49	4.16
Glutamic Acid	14.2	15.0	14.3	15.8
Proline	7.32	7.50	7.27	7.95
Glycine	3.01	3.04	2.94	3.35
Alanine	5.81	6.27	5.82	6.52
Cystine	1.77	1.69	1.56	1.72
Valine	4.08	4.16	4.04	4.40
Methionine	1.41	1.36	1.28	1.41
Isoleucine	2.81	2.86	2.80	3.03
Leucine	9.48	10.4	9.61	10.7
Tyrosine	2.66	2.91	2.73	3.01
Phenylalanine	3.74	4.05	3.77	4.19
Histidine	2.43	2.54	2.40	2.70
Lysine	2.52	2.52	2.41	2.98
Arginine	3.55	3.57	3.41	4.01
Tryptophan	0.551	0.630	0.540	0.522

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-892	Europe-893	Europe-894	Europe-895
Sample Identifier	Ref5-FS31-G	Ref5-FS32-G	Ref5-FS33-G	Ref5-FS34-G
Covance LIMS	00406702	00406697	00406716	00406708
Proximate (%)				
Protein	11.0	11.5	10.5	11.0
Moisture	8.18	8.68	7.97	7.77
Total Fat	3.04	3.18	3.33	3.20
Ash	1.30	1.50	1.10	1.09
Carbohydrates	76.5	75.1	77.1	76.9
Acid detergent fiber	2.84	3.54	3.09	3.68
Neutral detergent fiber	11.0	10.2	11.7	13.3
Vitamin E (mg/g)	0.0131	0.0140	0.0142	0.0133
Phytic acid (%)	0.802	0.658	0.614	0.676
Trypsin inhibitor (TIU/mg)	1.73	2.53	<1.0	<1.0
Minerals (ppm)				
Calcium	56.6	53.0	55.0	52.8
Copper	1.16	1.22	1.25	1.25
Iron	20.5	20.7	21.3	17.9
Magnesium	1170	1240	1290	1060
Manganese	6.41	7.22	7.57	5.93
Phosphorus	3220	3420	3630	3010
Potassium	3290	3360	3630	3180
Sodium	<100	<100	<100	<100
Zinc	15.6	16.7	17.8	17.7

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-892	Europe-893	Europe-894	Europe-895
Sample Identifier	Ref5-FS31-G	Ref5-FS32-G	Ref5-FS33-G	Ref5-FS34-G
Covance LIMS	00406702	00406697	00406716	00406708
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.267	0.278	0.297	0.271
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0426	0.0456	0.0489	0.0429
18:1 oleic	0.843	0.894	0.938	0.866
18:2 linoleic	1.69	1.78	1.81	1.74
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0246	0.0259	0.0267	0.0235
20:0 arachidic	0.0106	0.0111	0.0116	0.0106
20:1 eicosenoic	0.00831	0.00907	0.00931	0.00875
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00541	0.00490	0.00545	0.00462

Table 2 (Continued)
Grain Compositional Analyses

Site: FS-3, L'Isle Jourdain, France (Continued)

Monsanto ID	Europe-892	Europe-893	Europe-894	Europe-895
Sample Identifier	Ref5-FS31-G	Ref5-FS32-G	Ref5-FS33-G	Ref5-FS34-G
Covance LIMS	00406702	00406697	00406716	00406708
Amino Acids (mg/g)				
Aspartic Acid	7.71	7.85	7.52	7.28
Threonine	3.73	3.83	3.65	3.64
Serine	5.24	5.46	5.55	5.51
Glutamic Acid	22.4	23.0	21.2	21.6
Proline	10.9	11.0	9.98	10.0
Glycine	3.88	3.94	3.84	3.60
Alanine	9.19	9.44	9.00	8.89
Cystine	1.92	2.00	1.96	1.96
Valine	5.71	5.82	5.43	5.19
Methionine	1.70	1.74	1.80	1.83
Isoleucine	4.38	4.50	4.13	4.10
Leucine	15.7	16.3	15.3	15.7
Tyrosine	4.11	4.10	3.95	3.56
Phenylalanine	6.04	6.17	5.89	5.96
Histidine	2.98	3.01	3.00	2.90
Lysine	3.16	3.26	3.18	2.98
Arginine	4.66	4.74	4.66	4.13
Tryptophan	0.604	0.598	0.643	0.648

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy

Monsanto ID	Europe-924	Europe-925	Europe-926	Europe-927
Sample Identifier	NK603-IT41-G	NK603-IT42-G	NK603-IT43-G	NK603-1T44-G
Covance LIMS	00406746	00406745	00406739	00406742
Proximate (%)				
Protein	12.9	12.4	12.3	12.8
Moisture	7.34	7.47	7.66	7.71
Total Fat	4.04	3.90	3.57	3.73
Ash	1.14	1.40	1.27	1.29
Carbohydrates	74.6	74.8	75.2	74.5
Acid detergent fiber	2.80	3.15	2.94	3.57
Neutral detergent fiber	9.43	11.1	8.98	10.5
Vitamin E (mg/g)	0.00713	0.00739	0.00426	0.00719
Phytic acid (%)	0.808	0.774	0.727	0.472
Trypsin inhibitor (TIU/mg)	2.16	2.38	2.28	1.83
Minerals (ppm)				
Calcium	54.2	48.0	48.8	49.1
Copper	1.74	1.69	1.83	1.68
Iron	24.9	24.9	23.4	22.8
Magnesium	1180	1220	1140	1090
Manganese	.7.22	7.31	6.95	6.89
Phosphorus	3540	3640	3450	3310
Potassium	3480	3320	3160	3180
Sodium	<100	198	202	<100
Zinc	27.6	29.1	26.6	26.8

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-924	Europe-925	Europe-926	Europe-927
Sample Identifier	NK603-IT41-G	NK603-IT42-G	NK603-IT43-G	NK603-IT44-G
Covance LIMS	00406746	00406745	00406739	00406742
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.348	0.312	0.308	0.322
16:1 palmitoleic	0.00519	0.00436	0.00484	0.00511
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0685	0.0626	0.0609	0.0652
18:1 oleic	0.929	0.827	0.821	0.866
18:2 linoleic	2.41	2.07	2.09	2.15
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0400	0.0325	0.0344	0.0365
20:0 arachidic	0.0139	0.0124	0.0123	0.0135
20:1 eicosenoic	0.0118	0.0110	0.00999	0.0118
20:2 eicosadienoic	0.00577	0.00445	<0.00400	0.00438
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00668	0.00673	0.00533	0.00618

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-924	Europe-925	Europe-926	Europe-927
Sample Identifier	NK603-IT41-G	NK603-IT42-G	NK603-IT43-G	NK603-IT44-G
Covance LIMS	00406746	00406745	00406739	00406742
Amino Acids (mg/g)				
Aspartic Acid	8.07	8.04	7.81	8.06
Threonine	4.31	4.16	3.94	4.34
Serine	6.52	6.16	5.95	6.46
Glutamic Acid	26.1	26.2	24.9	25.3
Proline	11.8	11.7	10.9	11.7
Glycine	4.15	4.21	4.12	4.30
Alanine	10.3	10.4	9.88	10.0
Cystine	2.35	2.21	2.04	2.19
Valine	5.85	6.14	5.95	5.78
Methionine	2.29	2.27	2.16	2.22
Isoleucine	4.70	5.05	4.83	4.60
Leucine	18.5	18.7	17.6	17.9
Tyrosine	4.69	2.68	3.76	4.63
Phenylalanine	6.89	6.94	6.54	6.78
Histidine	3.29	3.38	3.32	3.33
Lysine	3.05	3.25	3.40	3.28
Arginine	5.09	4.78	4.92	5.42
Tryptophan	0.663	0.812	0.597	0.729

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-928	Europe-929	Europe-930	Europe-931
Sample Identifier	Control-IT41-G	Control-IT42-G	Control-IT43-G	Control-IT44-G
Covance LIMS	00406744	00406725	00406728	00406732
Proximate (%)				
Protein	12.0	11.6	11.0	11.2
Moisture	8.02	7.62	7.66	7.55
Total Fat	3.26	3.41	3.33	3.00
Ash	1.36	1.39	1.21	1.19
Carbohydrates	75.4	76.0	76.8	77.1
Acid detergent fiber	2.95	2.90	2.81	3.40
Neutral detergent fiber	10.7	10.0	9.59	10.7
Vitamin E (mg/g)	0.00613	0.00464	0.00648	0.0127
Phytic acid (%)	0.669	0.633	0.692	0.713
Trypsin inhibitor (TIU/mg)	2.19	<1.0	1.05	1.03
Minerals (ppm)				
Calcium	48.4	53.4	46.3	50.6
Copper	1.60	1.82	1.69	1.73
Iron	22.4	23.9	22.3	22.6
Magnesium	1050	1100	1030	1100
Manganese	6.66	6.72	6.10	6.77
Phosphorus	3200	3400	3210	3390
Potassium	3430	3600	3490	3490
Sodium	<100	<100	<100	<100
Zinc	26.5	27.6	25.0	26.0

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-928	Europe-929	Europe-930	Europe-931
Sample Identifier	Control-IT41-G	Control-IT42-G	Control-IT43-G	Control-IT44-G
Covance LIMS	00406744	00406725	00406728	00406732
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.279	0.280	0.280	0.231
16:1 palmitoleic	0.00436	0.00446	0.00408	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0558	0.0549	0.0557	0.0458
18:1 oleic	0.777	0.788	0.748	0.612
18:2 linoleic	1.92	1.90	1.94	1.64
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0346	0.0340	0.0346	0.0286
20:0 arachidic	0.0112	0.0112	0.0111	0.00953
20:1 eicosenoic	0.00964	0.00909	0.00899	0.00769
20:2 eicosadienoic	0.00427	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00588	0.00596	0.00578	0.00451

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-928	Europe-929	Europe-930	Europe-931
Sample Identifier	Control-IT41-G	Control-IT42-G	Control-IT43-G	Control-IT44-G
Covance LIMS	00406744	00406725	00406728	00406732
Amino Acids (mg/g)				
Aspartic Acid	7.73	7.08	6.98	7.10
Threonine	4.09	3.61	3.61	3.61
Serine	5.90	5.56	5.29	5.46
Glutamic Acid	24.4	22.8	21.8	22.4
Proline	11.4	10.4	9.79	9.97
Glycine	4.26	3.94	4.02	4.02
Alanine	9.65	9.13	8.67	8.93
Cystine	1.97	2.40	2.11	2.17
Valine	5.92	5.55	5.42	5.48
Methionine	2.04	2.23	2.12	2.33
Isoleucine	4.65	4.37	4.22	4.28
Leucine	17.0	16.0	15.0	15.6
Tyrosine	4.45	4.17	2.95	4.17
Phenylalanine	6.45	6.00	5.78	5.87
Histidine	3.35	3.08	3.11	3.05
Lysine	3.22	2.94	3.22	3.01
Arginine	5.33	4.69	4.76	4.78
Tryptophan	0.698	0.702	0.674	0.639

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-932	Europe-933	Europe-934	Europe-935
Sample Identifier	Refl-IT41-G	Refl-IT42-G	Refl-IT43-G	Refl-IT44-G
Covance LIMS	00406727	00406731	00406740	00406730
Proximate (%)				
Protein	10.5	11.5	11.3	10.7
Moisture	7.63	7.43	7.60	8.02
Total Fat	2.85	2.87	2.75	2.66
Ash	1.14	1.30	1.24	1.20
Carbohydrates	77.9	76.9	77.1	77.4
Acid detergent fiber	2.74	3.32	2.73	2.62
Neutral detergent fiber	10.4	10.2	10.1	10.7
Vitamin E (mg/g)	0.00584	0.00635	0.00587	0.0101
Phytic acid (%)	0.803	0.591	0.515	0.566
Trypsin inhibitor (TIU/mg)	1.08	1.04	1.26	1.31
Minerals (ppm)				
Calcium	50.2	53.5	54.9	52.4
Copper	1.60	1.60	1.64	1.80
Iron	21.4	21.9	22.8	22.5
Magnesium	1020	1070	1050	1120
Manganese	5.24	5.51	6.16	5.58
Phosphorus	2990	3080	3020	3230
Potassium	3420	3540	3410	3740
Sodium	<100	<100	<100	<100
Zinc	19.2	20.5	20.8	21.3

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-932	Europe-933	Europe-934	Europe-935
Sample Identifier	Refl-IT41-G	Refl-IT42-G	Refl-IT43-G	Refl-IT44-G
Covance LIMS	00406727	00406731	00406740	00406730
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.237	0.261	0.256	0.245
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0410	0.0428	0.0426	0.0413
18:1 oleic	0.651	0.672	0.672	0.656
18:2 linoleic	1.43	1.52	1.55	1.49
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0251	0.0260	0.0286	0.0270
20:0 arachidic	0.0178	0.00995	0.00975	0.00926
20:1 eicosenoic	0.00798	0.0101	0.00838	0.00785
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00504	0.00495	0.00513	0.00462

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-932	Europe-933	Europe-934	Europe-935
Sample Identifier	Refl-IT41-G	Refl-IT42-G	Refl-IT43-G	Refl-IT44-G
Covance LIMS	00406727	00406731	00406740	00406730
Amino Acids (mg/g)				
Aspartic Acid	6.92	7.35	7.28	6.99
Threonine	3.74	3.80	4.00	3.69
Serine	5.57	5.42	5.53	5.12
Glutamic Acid	21.4	22.9	21.7	21.3
Proline	9.76	10.0	10.1	9.55
Glycine	3.93	4.10	4.24	4.07
Alanine	8.44	8.97	8.53	8.36
Cystine	2.11	2.16	2.03	2.07
Valine	5.08	5.69	5.52	5.44
Methionine	2.03	2.21	1.97	1.92
Isoleucine	3.84	4.36	4.11	4.12
Leucine	14.4	15.6	14.6	14.3
Tyrosine	3.93	3.68	3.95	3.64
Phenylalanine	5.58	6.00	5.77	5.62
Histidine	2.98	3.15	3.21	3.10
Lysine	3.00	3.30	3.44	3.34
Arginine	4.78	4.88	5.31	4.99
Tryptophan	0.682	0.794	0.652	0.669

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-936	Europe-937	Europe-938	Europe-939
Sample Identifier	Ref2-IT41-G	Ref2-IT42-G	Ref2-IT43-G	Ref2-IT44-G
Covance LIMS	00406736	00406733	00406729	00406748
Proximate (%)				
Protein	10.5	10.9	10.8	10.4
Moisture	7.89	8.35	8.07	8.28
Total Fat	2.74	2.65	2.62	3.02
Ash	1.23	1.28	1.14	1.43
Carbohydrates	77.6	76.8	77.4	76.9
Acid detergent fiber	3.84	3.67	3.36	3.06
Neutral detergent fiber	10.7	11.5	11.6	10.6
Vitamin E (mg/g)	0.0136	0.00571	0.0108	0.0125
Phytic acid (%)	0.639	0.662	0.527	0.624
Trypsin inhibitor (TIU/mg)	2.18	<1.0	1.14	1.61
Minerals (ppm)				
Calcium	50.0	52.2	48.6	55.1
Copper	1.45	1.45	1.25	1.36
Iron	24.3	25.0	20.4	26.1
Magnesium	1100	1240	1070	1140
Manganese	7.40	8.50	7.67	8.01
Phosphorus	3130	3460	3130	3240
Potassium	3560	3960	3400	3780
Sodium	<100	<100	<100	<100
Zinc	21.5	24.0	21.3	22.5

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-936	Europe-937	Europe-938	Europe-939
Sample Identifier	Ref2-IT41-G	Ref2-IT42-G	Ref2-IT43-G	Ref2-IT44-G
Covance LIMS	00406736	00406733	00406729	00406748
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.279	0.271	0.270	0.308
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0432	0.0406	0.0411	0.0469
18:1 oleic	0.605	0.595	0.591	0.685
18:2 linoleic	1.61	1.52	1.52	1.73
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0287	0.0281	0.0285	0.0322
20:0 arachidic	0.00990	0.00970	0.00925	0.0110
20:1 eicosenoic	0.00944	0.00900	0.00850	0.0102
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00451	0.00438	0.00432	0.00579

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-936	Europe-937	Europe-938	Europe-939
Sample Identifier	Ref2-IT41-G	Ref2-IT42-G	Ref2-IT43-G	Ref2-IT44-G
Covance LIMS	00406736	00406733	00406729	00406748
Amino Acids (mg/g)				
Aspartic Acid	6.59	6.63	6.54	6.12
Threonine	3.58	3.56	3.44	3.38
Serine	5.00	5.08	5.00	4.85
Glutamic Acid	20.7	21.1	21.2	20.1
Proline	9.54	9.65	9.53	9.61
Glycine	3.88	3.76	3.60	3.43
Alanine	8.02	8.16	8.22	7.75
Cystine	2.09	2.07	2.26	2.40
Valine	5.37	5.36	5.25	5.04
Methionine	1.81	1.83	1.93	2.07
Isoleucine	3.89	3.93	3.91	3.72
Leucine	13.8	14.3	14.6	13.9
Tyrosine	3.56	3.94	3.88	3.56
Phenylalanine	5.32	5.44	5.50	5.18
Histidine	3.21	3.19	3.11	3.10
Lysine	3.20	3.00	2.88	2.66
Arginine	4.68	4.56	4.41	4.19
Tryptophan	0.616	0.638	0.621	0.594

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-940	Europe-941	Europe-942	Europe-943
Sample Identifier	Ref3-IT41-G	Ref3-IT42-G	Ref3-IT43-G	Ref3-IT44-G
Covance LIMS	00406724	00406735	00406737	00406747
Proximate (%)				
Protein	9.59	11.7	10.9	10.3
Moisture	7.85	9.94	8.03	7.79
Total Fat	3.29	2.71	3.06	3.24
Ash	1.16	0.916	1.22	1.34
Carbohydrates	78.1	74.7	76.8	77.3
Acid detergent fiber	3.26	2.92	2.92	3.38
Neutral detergent fiber	12.1	11.9	10.6	11.8
Vitamin E (mg/g)	0.00714	0.00694	0.00937	0.00517
Phytic acid (%)	0.795	0.549	0.552	0.669
Trypsin inhibitor (TIU/mg)	1.14	1.28	2.14	1.38
Minerals (ppm)				
Calcium	45.0	48.1	49.1	42.1
Copper	2.23	1.67	1.77	2.00
Iron	24.0	23.0	23.0	22.8
Magnesium	1170	1120	1150	1100
Manganese	7.58	8.71	8.84	7.59
Phosphorus	3390	3250	3290	3180
Potassium	3790	3640	3670	3520
Sodium	140	<100	<100	102
Zinc	24.8	25.2	24.5	23.1

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-940	Europe-941	Europe-942	Europe-943
Sample Identifier	Ref3-IT41-G	Ref3-IT42-G	Ref3-IT43-G	Ref3-IT44-G
Covance LIMS	00406724	00406735	00406737	00406747
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.347	0.286	0.322	0.352
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0528	0.0450	0.0511	0.0548
18:1 oleic	0.772	0.610	0.724	0.738
18:2 linoleic	1.93	1.58	1.73	1.95
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0378	0.0315	0.0351	0.0374
20:0 arachidic	0.0111	0.00953	0.0107	0.0117
20:1 eicosenoic	0.00880	0.00681	0.00786	0.00877
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400
22:0 behenic	0.00496	0.00487	0.00515	0.00611

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-940	Europe-941	Europe-942	Europe-943
Sample Identifier	Ref3-IT41-G	Ref3-IT42-G	Ref3-IT43-G	Ref3-IT44-G
Covance LIMS	00406724	00406735	00406737	00406747
Amino Acids (mg/g)				
Aspartic Acid	5.86	7.32	6.99	6.35
Threonine	3.29	3.97	3.74	3.67
Serine	4.51	5.48	5.22	5.00
Glutamic Acid	18.1	22.8	22.0	19.9
Proline	8.90	11.1	10.5	10.1
Glycine	3.58	4.17	3.99	3.80
Alanine	7.09	8.85	8.56	7.75
Cystine	2.38	2.21	2.01	2.17
Valine	4.78	5.76	5.56	5.05
Methionine	2.09	2.13	2.14	2.27
Isoleucine	3.47	4.34	4.16	3.70
Leucine	12.3	15.6	15.1	13.6
Tyrosine	3.33	4.24	4.09	3.70
Phenylalanine	4.76	6.03	5.80	5.25
Histidine	2.99	3.39	3.29	3.16
Lysine	2.87	3.24	2.95	2.86
Arginine	4.16	5.05	4.81	4.54
Tryptophan	0.649	0.728	0.656	0.695

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-944	Europe-945	Europe-946	Europe-947
Sample Identifier	Ref4-IT41-G	Ref4-IT42-G	Ref4-IT43-G	Ref4-IT44-G
Covance LIMS	00406750	00406741	00406743	00406751
Proximate (%)				
Protein	11.0	10.4	10.9	10.8
Moisture	7.62	8.07	8.33	7.78
Total Fat	3.03	3.29	3.00	3.14
Ash	1.27	1.30	1.27	1.57
Carbohydrates	77.1	76.9	76.5	76.7
Acid detergent fiber	3.68	4.06	3.38	3.37
Neutral detergent fiber	12.0	11.2	11.6	11.0
Vitamin E (mg/g)	0.00664	0.00917	0.00833	0.00652
Phytic acid (%)	0.521	0.491	0.619	0.524
Trypsin inhibitor (TIU/mg)	2.81	1.99	1.61	2.47
Minerals (ppm)				
Calcium	58.3	62.7	54.5	58.8
Copper	1.56	1.79	1.67	1.59
Iron	20.4	21.8	19.5	20.6
Magnesium	1120	1160	1120	1100
Manganese	7.25	7.47	7.09	7.02
Phosphorus	3090	3190	3110	3070
Potassium	3430	3740	3630	3490
Sodium	107	<100	<100	<100

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-944	Europe-945	Europe-946	Europe-947
Sample Identifier	Ref4-IT41-G	Ref4-IT42-G	Ref4-IT43-G	Ref4-IT44-G
Covance LIMS	00406750	00406741	00406743	00406751
Zinc	21.8	23.8	22.4	21.5
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.294	0.319	0.291	0.303
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0474	0.0518	0.0455	0.0488
18:1 oleic	0.718	0.772	0.701	0.748
18:2 linoleic	1.77	1.85	1.71	1.80
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0300	0.0308	0.0296	0.0317
20:0 arachidic	0.0101	0.0113	0.00984	0.0104
20:1 eicosenoic	0.00923	0.00983	0.00856	0.00952
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	0.00452
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-944	Europe-945	Europe-946	Europe-947
Sample Identifier	Ref4-IT41-G	Ref4-IT42-G	Ref4-IT43-G	Ref4-IT44-G
Covance LIMS	00406750	00406741	00406743	00406751
22:0 behenic	0.00518	0.00541	0.00493	0.00530
Amino Acids (mg/g)				
Aspartic Acid	6.71	7.00	6.87	6.92
Threonine	3.85	3.88	3.82	3.86
Serine	5.28	5.24	5.26	5.33
Glutamic Acid	20.6	20.2	20.7	20.8
Proline	10.1	9.84	10.4	10.1
Glycine	3.85	4.13	4.04	3.98
Alanine	8.01	7.82	8.09	8.09
Cystine	2.43	2.13	2.26	2.24
Valine	5.04	5.09	5.26	5.17
Methionine	2.47	2.23	2.34	2.28
Isoleucine	3.70	3.65	3.84	3.78
Leucine	13.9	13.3	14.0	14.0
Tyrosine	3.91	3.79	3.82	3.46
Phenylalanine	5.35	5.20	5.41	5.34
Histidine	3.09	3.24	3.22	3.16
Lysine	2.88	3.26	3.12	2.99
Arginine	4.67	5.27	5.09	4.72
Tryptophan	0.675	0.656	0.691	0.709

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-948	Europe-949	Europe-950	Europe-951
Sample Identifier	Ref5-IT41-G	Ref5-IT42-G	Ref5-IT43-G	Ref5-IT44-G
Covance LIMS	00406749	00406726	00406738	00406734
Proximate (%)				
Protein	10.0	10.6	10.2	10.2
Moisture	7.80	8.17	8.46	8.06
Total Fat	2.50	2.64	2.35	2.50
Ash	1.16	1.28	1.23	1.12
Carbohydrates	78.5	77.3	77.8	78.1
Acid detergent fiber	2.73	3.00	3.04	3.00
Neutral detergent fiber	9.96	9.55	10.9	9.55
Vitamin E (mg/g)	0.00516	0.00491	0.00369	0.00468
Phytic acid (%)	0.729	0.771	0.773	0.546
Trypsin inhibitor (TIU/mg)	1.08	<1.0	1.82	1.01
Minerals (ppm)				
Calcium	40.0	41.3	42.7	39.9
Copper	1.46	1.12	1.44	1.31
Iron	21.2	21.2	21.5	21.3
Magnesium	1190	1100	1110	1140
Manganese	7.00	6.38	6.70	6.69
Phosphorus	3470	3230	3300	3340
Potassium	3620	3350	3400	3370
Sodium	<100	<100	<100	113

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-948	Europe-949	Europe-950	Europe-951
Sample Identifier	Ref5-IT41-G	Ref5-IT42-G	Ref5-IT43-G	Ref5-IT44-G
Covance LIMS	00406749	00406726	00406738	00406734
Zinc	22.1	20.8	21.6	21.6
Fatty Acids (%)				
8:0 caprylic	<0.00400	<0.00400	<0.00400	<0.00400
10:0 capric	<0.00400	<0.00400	<0.00400	<0.00400
12:0 lauric	<0.00400	<0.00400	<0.00400	<0.00400
14:0 myristic	<0.00400	<0.00400	<0.00400	<0.00400
14:1 myristoleic	<0.00400	<0.00400	<0.00400	<0.00400
15:0 pentadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
15:1 pentadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
16:0 palmitic	0.276	0.288	0.263	0.271
16:1 palmitoleic	<0.00400	<0.00400	<0.00400	<0.00400
17:0 heptadecanoic	<0.00400	<0.00400	<0.00400	<0.00400
17:1 heptadecenoic	<0.00400	<0.00400	<0.00400	<0.00400
18:0 stearic	0.0340	0.0353	0.0318	0.0331
18:1 oleic	0.480	0.514	0.450	0.474
18:2 linoleic	1.51	1.57	1.41	1.52
18:3 gamma linolenic	<0.00400	<0.00400	<0.00400	<0.00400
18:3 linolenic	0.0286	0.0294	0.0259	0.0276
20:0 arachidic	0.00795	0.00825	0.00722	0.00765
20:1 eicosenoic	0.00790	0.00812	0.00719	0.00766
20:2 eicosadienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:3 eicosatrienoic	<0.00400	<0.00400	<0.00400	<0.00400
20:4 arachidonic	<0.00400	<0.00400	<0.00400	<0.00400

Table 2 (Continued)
Grain Compositional Analyses

Site: IT-4, Bagnarola, Italy (Continued)

Monsanto ID	Europe-948	Europe-949	Europe-950	Europe-951
Sample Identifier	Ref5-IT41-G	Ref5-IT42-G	Ref5-IT43-G	Ref5-IT44-G
Covance LIMS	00406749	00406726	00406738	00406734
22:0 behenic	0.00502	0.00476	0.00421	0.00465
Amino Acids (mg/g)				
Aspartic Acid	6.25	6.67	6.72	6.72
Threonine	3.40	3.42	3.41	3.42
Serine	4.81	4.99	4.86	4.90
Glutamic Acid	19.1	20.4	20.3	20.5
Proline	9.35	9.40	9.44	9.32
Glycine	3.51	3.68	3.80	3.70
Alanine	7.40	7.94	7.78	7.96
Cystine	1.96	2.06	2.04	2.03
Valine	4.82	5.15	5.20	5.15
Methionine	1.87	1.84	2.07	1.84
Isoleucine	3.54	3.86	3.80	3.85
Leucine	12.9	13.9	13.4	13.8
Tyrosine	3.48	2.36	3.58	3.23
Phenylalanine	5.02	5.33	5.24	5.37
Histidine	2.85	3.00	3.02	2.98
Lysine	2.69	2.94	3.10	2.97
Arginine	4.28	4.13	4.45	4.29
Tryptophan	0.503	0.594	0.615	0.592

APPENDIX A

Analytical Method Summaries and Reference Standards

ANALYTICAL METHOD SUMMARIES AND REFERENCE STANDARDS

Protein (PGEN)
Nitrogenous compounds in the sample were reduced in the presence of boiling sulfuric acid and a mercury catalyst mixture to form ammonia. The acid digest was made alkaline. The ammonia was distilled and then titrated with a standard acid. The percent nitrogen was calculated and converted to protein using the factor 6.25. The limit of detection for this study was 0.1%. There is no analytical reference standard for this analysis.

References:
Official Methods of Analysis of AOAC INTERNATIONAL, 17th Ed., Methods 955.04 and 979.09, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2000), modified.

Bradstreet, R. B., *The Kjeldahl Method for Organic Nitrogen*, Academic Press: New York, New York, (1965), modified.

Kalthoff, I.M., and Sandell, E.B., *Quantitative Inorganic Analysis*, MacMillan: New York, (1948), modified.

Moisture (M100)
The sample was dried in a vacuum oven at 100°C to a constant weight. The moisture weight loss was determined and converted to percent moisture. The limit of detection for this study was 0.1%. There is no analytical reference standard for this analysis.

Reference:
Official Methods of Analysis of AOAC INTERNATIONAL, 17th Ed., Methods 926.08 and 925.09, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2000), modified.

Fat by Acid Hydrolysis (FAAH)
The sample was hydrolyzed with hydrochloric acid at an elevated temperature. The fat was extracted using ether and hexane. The extract was washed with a dilute alkali solution and filtered through a sodium sulfate column. The extract was then evaporated, dried, and weighed. The limit of detection for this study was 0.1%. There is no analytical reference standard for this analysis.

Reference:
Official Methods of Analysis of AOAC INTERNATIONAL, 17th Ed., Methods 922.06 and 954.02, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2000), modified.

Fat by Soxhlet Extraction (FSOX)
The sample was weighed into a cellulose thimble containing sand or sodium sulfate and dried to remove excess moisture. Pentane was dripped through the sample to remove the fat. The extract was then evaporated, dried, and weighed. The limit of detection for this study was 0.1%. There is no analytical reference standard for this analysis.

Reference:
Official Methods of Analysis of AOAC INTERNATIONAL, 17th Ed., Method 960.39, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2000), modified.

Ash (ASHM)
The sample was placed in an electric furnace at 550°C and ignited to drive off all volatile organic matter. The nonvolatile matter remaining was quantitated gravimetrically and calculated to determine percent ash. The limit of detection for this study was 0.1%. There is no analytical reference standard for this analysis.

Reference:
Official Methods of Analysis of AOAC INTERNATIONAL, 17th Ed., Method 923.03, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2000), modified.

Carbohydrates (CHO)
The total carbohydrate level was calculated by difference using the fresh weight-derived data and the following equation:

% carbohydrates = 100 % - (% protein + % fat + % moisture + % ash)

The limit of detection for this study was 1.0%. There is no analytical reference standard for this analysis.

Reference:
United States Department of Agriculture, "Energy Value of Foods", *Agriculture Handbook No. 74*, pp. 2-11, (1973).

Neutral Detergent Fiber, Enzyme Method (NDFE)
The sample was placed in a fritted vessel and washed with a neutral boiling detergent solution that dissolved the protein, carbohydrate, enzyme, and ash. An acetone wash removed the fats and pigments. Hemicellulose, cellulose, and lignin fractions were collected on the frit and determined gravimetrically. The limit of detection for this study was 0.1%. There is no analytical reference standard for this analysis.

References:
Approved Methods of the American Association of Cereal Chemists, 9th Ed., Method 32.20, (1998), modified.

Forage Fiber Analyses, Agriculture Handbook No.379, United States Department of Agriculture, (1970), modified.

Acid Detergent Fiber (ADF)
The sample was placed in a fritted vessel and washed with an acidic boiling detergent solution that dissolved the protein, carbohydrate, and ash. An acetone wash removed the fats and pigments. Lignocellulose fraction was collected on the frit and determined gravimetrically. The limit of detection for this study was 0.1%. There is no analytical reference standard for this analysis.

Reference:
Forage Fiber Analyses, Agriculture Handbook No.379, United States Department of Agriculture, (1970), modified.

Amino Acid Composition (TAAP)
Total aspartic acid (including asparagine)
Total threonine
Total serine
Total glutamic acid (including glutamine)
Total proline

Total glycine
Total alanine
Total valine
Total isoleucine
Total leucine
Total tyrosine
Total phenylalanine
Total histidine
Total lysine
Total arginine
Total tryptophan
Sulfur-containing amino acids: Total methionine
Total cystine (including cysteine)

The sample was assayed by three methods to obtain the full profile. Tryptophan required a base hydrolysis with sodium hydroxide. The sulfur containing amino acids required an oxidation with performic acid prior to hydrolysis with hydrochloric acid. Analysis of the samples for the remaining amino acids was accomplished through direct acid hydrolysis with hydrochloric acid. Once hydrolyzed, the individual amino acids were then quantitated using an automated amino acid analyzer. The limit of detection for this study was 0.1 mg/g.

Reference Standards:
Beckman K18, 2.5 µmol/mL per constituent except cystine (1.25 µmol/mL), Lot Numbers S901670 and S911165
Aldrich L-Tryptophan, 99%, Lot Number 12729HS
Aldrich L-Cysteic Acid Monohydrate, 98.0%, Lot Number 04615MS
Sigma L-Methionine Sulfone, used as 100%, Lot Number 12H3349

Reference:
Official Methods of Analysis of AOAC INTERNATIONAL, 17th Ed., Method 982.30, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2000), modified.

Fatty Acids (FAPM)

The lipid was extracted and saponified with 0.5 N sodium hydroxide in methanol. The saponification mixture was methylated with 14% boron trifluoride:methanol. The resulting methyl esters were extracted with heptane containing an internal standard. The methyl esters of the fatty acids were analyzed by gas chromatography using external standards for quantitation. The limit of detection was 0.00400%.

Reference Standards:
Nu Chek Prep Hazleton Special Prep No. 1, used as 100%, Lot Number A4-K
Nu Chek Prep Special Prep No. 2, used as 100%, Lot Number S10-G
Nu Chek Prep Special Prep No. 3, used as 100%, Lot Number F23-J
Nu Chek Prep Hazleton Special Prep No. 4, used as 100%, Lot Number JY26-J
Nu Chek Prep Methyl Gamma Linolenate, used as 100%, Lot Number U-63M-F25-J

Reference:
Official Methods and Recommended Practices of the AOCS, 5th Ed., Method Ce 1-62, American Oil Chemists' Society: Champaign, Illinois, (1997), modified.

Vitamin E (EFD2)

The product was saponified to break down any fat and release any vitamin E. The saponified mixture was extracted with ethyl ether and then quantitated directly by high-performance liquid chromatography on a silica column. The limit of detection for this study was approximately 0.005 mg/g.

Reference Standard:
USP Alpha Tocopherol, 100%, Lot Number M

Reference:
Cort, W. M., Vincente, T. S., Waysek, E.H., and Williams, B. D., "Vitamin E Content of Feedstuffs Determined by High-Performance Liquid Chromatographic Fluorescence," *Journal of Agricultural Food Chemistry, 31*:1330-1333, (1983), modified.

Phytic Acid (PHYT)

The sample was extracted using ultrasonication. Purification and concentration was done on a silica based anion exchange (SAX) column. Sample analysis was done on a macroporous polymer HPLC column PRP-1, 5µm (150 x 4.1) and a refractive index detector. The limit of quantitation for this study was approximately between 0.0500 and 0.0800%.

Reference Standard:
Aldrich Phytic Acid, Dodecasodium Salt Hydrate, 99%, Lot Number 13529MS

References:
Lehrfeld, Jacob, "High-Performance Liquid Chromatography Analysis of Phytic Acid on a pH-Stable, Macroporous Polymer column," *Cereal Chemistry, 66*(6):510-515, (1989), modified.

Lehrfeld, Jacob, "HPLC Separation and Quantitation of Phytic Acid and Some Inositol Phosphates in Foods: Problem and Solutions," *Journal of Agricultural Food Chemistry, 42*:2726-2731, (1994), modified.

Trypsin Inhibitor (TRIP)

Trypsin inhibitor activity in the sample was determined by suspending the ground, defatted sample in dilute sodium hydroxide solution. An appropriate dilution of the suspension was made, and an increasing series of aliquots of the diluted suspension was mixed with trypsin and benzoyl-DL-arginine-p-nitroanalide hydrochloride. After 10 minutes, the action of the trypsin was stopped by the addition of acetic acid. The diluted suspension mixture was filtered or centrifuged and the absorbance of each filtered solution was measured at 410 nm. Trypsin inhibitor activity was calculated from the change in absorbance values due to the aliquot volume. The limit of detection for this study was 1.0 Trypsin Inhibitor Unit/mg.

Reference:
Official Methods and Recommended Practices of the American Oil Chemists' Society, 5th Ed., Method Ba 12-75, American Oil Chemists' Society: Champaign, Illinois, (1997), modified.

ICP Emission Spectrometry (ICPS)

Calcium
Copper
Iron
Magnesium
Manganese
Phosphorus
Potassium
Sodium
Zinc

The sample was dried, precharred, and ashed overnight at 500° ± 50°C. The ashed sample was treated with hydrochloric acid, taken to dryness, and put into a solution of 5% hydrochloric acid. The amount of each element was determined at appropriate wavelengths by comparing the emission of the unknown sample, measured by the inductively coupled plasma, with the emission of the standard solutions.

Spex CertiPrep Reference Standards and Limits of Detection:

Mineral	Lot Numbers	Concentration (ppm)	Limit of Detection (ppm)
Calcium	L6-59CA	10,000	20.0
Copper	6-242CU	1,000	0.500
Iron	7-97FE	1,000	2.00
Magnesium	L5-187MG	10,000	20.0
Manganese	6-201MN	1,000	0.300
Phosphorus	K6-54P	10,000	20.0
Potassium	M6-16K	10,000	100
Sodium	M6-41NA	10,000	100
Zinc	6-264ZN	1,000	0.400

References:

Dahlquist, R.L., and Knoll, J.W., "Inductively Coupled Plasma-Atomic Emission Spectrometry: Analysis of Biological Materials and Soils for Major, Trace, and Ultra Trace Elements," *Applied Spectroscopy, 32*:1-29, (1978), modified.

Official Methods of Analysis of AOAC INTERNATIONAL, 17th Ed., Methods 984.27 and 985.01, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2000), modified.

APPENDIX 3

Certus International, Inc. Statistical Report:

Compositional Analyses of Tissues Collected from Roundup® Tolerant Corn Line NK603 Grown in 1999 E.U. Field Trials

The following 32 pages are the final statistical report.

STATISTICAL REPORT

Compositional Analyses of Tissues Collected from Roundup® Tolerant Corn Line NK603 Grown in 1999 E.U. Field Trials

STUDY NUMBER:	99-01-46-52
REPORT NUMBER:	MSL-16897
SPONSOR:	Monsanto Company Biotechnology Regulatory Sciences 700 Chesterfield Parkway North St. Louis, MO 63198
PREPARED BY:	Certus International, Inc. 1422 Elbridge Payne Road Suite 200 Chesterfield, MO 63017
DATE:	September 21, 2000

Roy Sorbet, M.S., M.Ap.Stat.
Manager, Biostatistics and Data Management

9-21-2000
Date

TABLE OF CONTENTS

1. Data Handling

A SAS® data set containing corn forage and grain compositional analyses from a Roundup® tolerant transgenic test line, NK603, a non-transgenic control line, LH82 x B73BC2S2 and nineteen additional commercial lines was received from Monsanto. Data were from four E.U. sites. This report provides the statistical results for the comparison of the Roundup Ready® test line to its non-transgenic control line.

Analytes with greater than fifty percent of observations at or below the assay detection limit (D.L.) were excluded from summaries and analysis. Excluded analytes are presented in Listing 1. Otherwise, results at or below the detection limit were assigned a value equal to half the detection limit. The following grain analytes were assigned values:

Analyte	Units	Obser. Below D.L.	D.L.	Value Assigned
22:0 Behenic	% fresh weight (FW)	3 (3%)	0.004	0.002
Trypsin Inhibitor	TIU/mg FW	28 (26%)	1.0	0.5

The following formulas were used for re-expression of composition data for statistical analysis:

Component	From (X)	To	Formula
Proximates (excluding moisture), Fiber, Phytic acid	% fresh weight (FW)	% dry weight (DW)	X/d^*
Vitamin E	mg/g FW	mg/g DW	X/d
Trypsin Inhibitor	TIU/mg FW	TIU/mg DW	X/d
Copper, Iron, Manganese, Zinc	ppm FW	mg/kg DW	X/d
Calcium, Magnesium, Phosphorus, Potassium, Sodium	ppm FW	% DW	$(X/d) \times 10^{-4}$
Amino Acids (AA)	mg/g FW	% Total AA	$(100)X_j/\Sigma X_j$, for each AA j
Fatty Acids (FA)	% FW	% Total FA	$(100)X_j/\Sigma X_j$, for each FA j
* d is the fraction of the sample that is dry matter.			

2. Statistical Methodology

At two E.U. sites, FS-3 and IT-4, the test event NK603 and the non-transgenic control line, LH82 x B73BC2S2, were each grown in single plots randomly assigned within each of four replication blocks. Control compositional analysis results were not provided for replicate 4 of site FS-3 due to contamination with NK603. Compositional analysis components from the two sites were statistically analyzed using a mixed model analysis of variance.

The sites were analyzed separately and combined. Individual replicated site analyses used the model:

$$Y_{ij} = U + T_i + B_j + e_{ij},$$

where Y_{ij} = unique individual observation, U = overall mean, T_i = line effect, B_j = random block effect, and e_{ij} = residual error.

Combined site analyses used the model:

$$Y_{ijk} = U + T_i + L_j + B(L)_{jk} + LT_{ij} + e_{ijk},$$

where Y_{ijk} = unique individual observation, U = overall mean, T_i = line effect, L_j = random location effect, $B(L)_{jk}$ = random block within location effect, LT_{ij} = random location by line interaction effect, and e_{ijk} = residual error. For each compositional analysis component, the test event NK603 was compared to the non-transgenic control line, LH82 x B73BC2S2.

At two additional E.U. sites, FN-1 and FN-2, the test event NK603 and the non-transgenic control line, LH82 x B73BC2S2, were each grown at separate locations within the site. Each was replicated on four plots. Due to the lack of appropriate within-site blocking to account for location effects, results from these two sites were not included in the analysis. For each of the two sites, simple statistics were calculated for each compositional analysis component.

Data for compositional analysis components from additional commercial reference lines were not included in the statistical analysis. However, a range of observed values was determined. Additionally, the commercial reference line data was used to develop population tolerance intervals. A tolerance interval is an interval that one can claim, with a specified degree of confidence, $100(1-\alpha)\%$, contains at least a specified proportion, p, of an entire sampled population for the parameter measured. For each compositional analysis component, tolerance intervals were calculated that are expected to contain, with 95% confidence, 99% of the quantities expressed in the population of commercial lines. Because negative quantities are not possible, negative calculated lower tolerance bounds were set to zero.

SAS®[1] software was used to generate all summary statistics and perform all analyses. Report tables present p-values from SAS® as either <0.001 or the actual value truncated to three decimal places.

3. Results

Statistical results are summarized in Tables 1-6 for sites FS-3 and IT-4, individually and combined. For each compositional component, least-square means, standard errors (S.E.), and the range of observed values are presented for each line. Mean differences, standard errors of the differences, the range of observed differences, 95% confidence intervals for the mean differences and the significance probability are presented for each comparison. In addition, the range of the observed commercial values and the 95% tolerance interval are also presented. Statistically significant probabilities ($p<0.05$) are summarized in Table 7.

Results for sites FN-1 and FN-2 are summarized in Tables 8 and 9, respectively. For each compositional component, means, standard errors (S.E.), and the range of observed values are presented for each line.

The numbers of significant comparisons ($P< 0.05$) observed in the analysis of variance are summarized below:

		No. of Significant Comparisons:
Site	Comparisons Tested	NK603 vs. Control
FS-3	51	7
IT-4	51	11
Combined	51	9

[1] SAS Institute Inc., *SAS OnlineDoc™, Version 8*, Cary, NC: SAS Institute Inc., 1999.

TABLE 1. Site FS-3 (NK603 vs. Control): Statistical Summary of Corn Forage Proximate and Fiber Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Proximate						
Ash (% DW)	3.58 ± 0.27 (2.82 - 4.07)	3.79 ± 0.31 (3.35 - 4.36)	-0.21 ± 0.41 (-1.54 - 0.46)	0.656	-1.96,1.54	(2.43 - 9.64) [0,12.47]
Carbohydrates (% DW)	85.62 ± 0.64 (84.87 - 87.53)	84.46 ± 0.73 (83.08 - 85.52)	1.17 ± 0.81 (-0.40 - 2.50)	0.287	-2.33,4.66	(76.50 - 87.29) [75.55,91.37]
Fat, total (% DW)	3.42 ± 0.12 (3.24 - 3.62)	3.74 ± 0.12 (3.46 - 4.02)	-0.32 ± 0.081 (-0.49 - -0.22)	0.057	-0.67,0.025	(1.42 - 4.57) [0.84,4.80]
Moisture (% FW)	62.85 ± 0.89 (61.60 - 63.40)	62.90 ± 1.02 (60.40 - 65.60)	-0.050 ± 1.35 (-2.50 - 3.00)	0.973	-5.88,5.78	(56.50 - 80.40) [45.40,96.42]
Protein (% DW)	7.38 ± 0.45 (6.37 - 7.89)	8.06 ± 0.50 (7.03 - 9.24)	-0.68 ± 0.53 (-1.81 - 0.15)	0.327	-2.95,1.60	(4.98 - 11.56) [4.02,12.46]
Fiber						
Fiber, acid detergent (% DW)	22.54 ± 1.12 (19.27 - 25.99)	20.11 ± 1.30 (19.39 - 21.31)	2.43 ± 1.72 (0.65 - 6.37)	0.292	-4.96,9.82	(17.54 - 38.31) [9.80,44.43]
Fiber, neutral detergent (% DW)	35.23 ± 1.65 (31.77 - 38.21)	36.54 ± 1.78 (34.85 - 41.86)	-1.31 ± 1.42 (-3.65 - 1.22)	0.453	-7.43,4.81	(27.93 - 54.75) [20.77,61.87]

[1]95% tolerance interval to contain 99% of the commercial line population. Negative limits were set to zero.

TABLE 2. Site FS-3 (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Amino Acid (% Total AA)						
Alanine (%)	8.04 ± 0.033 (7.95 - 8.12)	8.00 ± 0.037 (7.99 - 8.05)	0.047 ± 0.034 (0.015 - 0.12)	0.295	-0.098,0.19	(7.38 - 8.13) [7.20,8.35]
Arginine (%)	4.01 ± 0.11 (3.74 - 4.24)	4.27 ± 0.12 (4.18 - 4.36)	-0.26 ± 0.16 (-0.55 - -0.021)	0.252	-0.96,0.44	(3.77 - 4.98) [3.45,5.03]
Aspartic acid (%)	6.58 ± 0.10 (6.42 - 6.96)	6.27 ± 0.12 (6.25 - 6.32)	0.31 ± 0.14 (0.19 - 0.64)	0.154	-0.28,0.90	(6.02 - 7.51) [5.53,7.61]
Cystine (%)	1.89 ± 0.042 (1.77 - 1.98)	1.94 ± 0.048 (1.89 - 1.98)	-0.048 ± 0.064 (-0.19 - 0.090)	0.530	-0.32,0.23	(1.68 - 2.51) [1.56,2.43]
Glutamic acid (%)	19.58 ± 0.22 (18.98 - 20.08)	18.87 ± 0.26 (18.69 - 19.02)	0.70 ± 0.34 (-0.043 - 1.39)	0.176	-0.77,2.18	(18.38 - 20.08) [18.03,20.76]
Glycine (%)	3.56 ± 0.049 (3.42 - 3.64)	3.66 ± 0.056 (3.60 - 3.77)	-0.10 ± 0.065 (-0.19 - 0.044)	0.253	-0.38,0.18	(3.27 - 4.01) [3.06,4.15]
Histidine (%)	2.67 ± 0.023 (2.62 - 2.74)	2.81 ± 0.027 (2.78 - 2.85)	-0.14 ± 0.036 (-0.22 - -0.039)	0.057	-0.29,0.011	(2.58 - 3.15) [2.34,3.36]
Isoleucine (%)	3.74 ± 0.060 (3.54 - 3.87)	3.70 ± 0.067 (3.61 - 3.74)	0.033 ± 0.064 (-0.071 - 0.15)	0.652	-0.24,0.31	(3.34 - 3.85) [3.35,3.97]
Leucine (%)	13.66 ± 0.13 (13.38 - 14.03)	13.56 ± 0.15 (13.27 - 13.77)	0.10 ± 0.20 (-0.40 - 0.41)	0.658	-0.77,0.98	(12.18 - 14.34) [11.73,14.76]
Lysine (%)	2.86 ± 0.078 (2.73 - 3.03)	2.97 ± 0.083 (2.80 - 3.20)	-0.11 ± 0.058 (-0.17 - 0.012)	0.202	-0.36,0.14	(2.58 - 3.67) [2.22,3.68]
Methionine (%)	1.78 ± 0.036 (1.66 - 1.85)	1.87 ± 0.042 (1.85 - 1.90)	-0.096 ± 0.056 (-0.24 - -0.023)	0.225	-0.34,0.14	(1.49 - 2.32) [1.39,2.49]

TABLE 2. Site FS-3 (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Phenylalanine (%)	5.19 ± 0.023 (5.13 - 5.26)	5.25 ± 0.025 (5.21 - 5.29)	-0.061 ± 0.024 (-0.11 - -0.030)	0.125	-0.16,0.042	(4.85 - 5.54) [4.59,5.61]
Proline (%)	9.54 ± 0.048 (9.46 - 9.71)	9.26 ± 0.053 (9.23 - 9.31)	0.28 ± 0.052 (0.23 - 0.40)	0.033	0.054,0.50	(8.74 - 9.91) [8.61,10.09]
Serine (%)	4.72 ± 0.12 (4.47 - 5.17)	4.98 ± 0.14 (4.92 - 5.09)	-0.26 ± 0.15 (-0.45 - 0.081)	0.224	-0.90,0.38	(4.41 - 5.22) [4.36,5.19]
Threonine (%)	3.31 ± 0.075 (3.14 - 3.57)	3.36 ± 0.081 (3.29 - 3.50)	-0.044 ± 0.060 (-0.15 - 0.069)	0.535	-0.30,0.21	(3.24 - 3.66) [3.14,3.69]
Tryptophan (%)	0.61 ± 0.020 (0.55 - 0.63)	0.65 ± 0.021 (0.59 - 0.69)	-0.039 ± 0.0088 (-0.056 - -0.025)	0.047	-0.077,-0.0012	(0.49 - 0.79) [0.45,0.76]
Tyrosine (%)	3.36 ± 0.13 (2.94 - 3.63)	3.65 ± 0.15 (3.60 - 3.66)	-0.29 ± 0.18 (-0.66 - -0.021)	0.252	-1.08,0.50	(2.32 - 3.90) [3.00,4.03]
Valine (%)	4.92 ± 0.064 (4.75 - 5.00)	4.94 ± 0.067 (4.74 - 5.04)	-0.019 ± 0.034 (-0.090 - 0.021)	0.633	-0.17,0.13	(4.65 - 5.29) [4.64,5.38]
Fatty Acid (% Total FA)						
16:0 palmitic (%)	8.56 ± 0.052 (8.47 - 8.66)	8.97 ± 0.060 (8.89 - 9.13)	-0.42 ± 0.080 (-0.66 - -0.24)	0.034	-0.76,-0.072	(9.12 - 12.62) [7.35,14.72]
18:0 stearic (%)	1.61 ± 0.0066 (1.59 - 1.62)	1.68 ± 0.0076 (1.67 - 1.69)	-0.071 ± 0.010 (-0.083 - -0.044)	0.019	-0.11,-0.028	(1.19 - 2.02) [1.02,2.27]
18:1 oleic (%)	22.96 ± 0.088 (22.82 - 23.13)	23.76 ± 0.10 (23.52 - 23.99)	-0.80 ± 0.13 (-1.16 - -0.55)	0.027	-1.38,-0.22	(20.21 - 34.64) [12.65,39.86]
18:2 linoleic (%)	65.08 ± 0.10 (64.92 - 65.25)	63.74 ± 0.12 (63.58 - 64.04)	1.34 ± 0.16 (0.87 - 1.66)	0.013	0.66,2.02	(49.72 - 65.98) [44.59,73.50]
18:3 linolenic (%)	1.02 ± 0.0088 (0.99 - 1.03)	1.06 ± 0.010 (1.05 - 1.07)	-0.041 ± 0.013 (-0.082 - -0.012)	0.091	-0.099,0.016	(0.71 - 1.50) [0.54,1.72]

TABLE 2. Site FS-3 (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
20:0 arachidic (%)	0.35 ± 0.0032 (0.34 - 0.36)	0.34 ± 0.0035 (0.33 - 0.34)	0.011 ± 0.0033 (0.0050 - 0.016)	0.076	-0.0029,0.025	(0.31 - 0.74) [0.17,0.64]
20:1 eicosenoic (%)	0.29 ± 0.0039 (0.28 - 0.30)	0.28 ± 0.0045 (0.28 - 0.29)	0.0052 ± 0.0060 (-0.0022 - 0.016)	0.478	-0.021,0.031	(0.26 - 0.40) [0.21,0.42]
22:0 behenic (%)	0.14 ± 0.0074 (0.12 - 0.16)	0.16 ± 0.0079 (0.15 - 0.18)	-0.025 ± 0.0062 (-0.034 - -0.013)	0.057	-0.051,0.0020	(0.073 - 0.22) [0.093,0.24]
Mineral						
Calcium (% DW)	0.0051 ± 0.00014 (0.0050 - 0.0052)	0.0053 ± 0.00016 (0.0050 - 0.0057)	-0.00012 ± 0.00022 (-0.00056 - 0.00021)	0.646	-0.0010,0.00081	(0.0039 - 0.0076) [0.0028,0.0082]
Copper (mg/kg DW)	1.90 ± 0.053 (1.77 - 1.99)	1.81 ± 0.061 (1.69 - 1.92)	0.089 ± 0.081 (-0.15 - 0.27)	0.388	-0.26,0.44	(1.16 - 2.78) [0.45,3.16]
Iron (mg/kg DW)	19.50 ± 0.63 (17.43 - 21.15)	18.97 ± 0.72 (18.52 - 19.63)	0.53 ± 0.96 (-1.32 - 2.63)	0.632	-3.58,4.65	(15.42 - 29.34) [10.60,33.63]
Magnesium (% DW)	0.11 ± 0.0037 (0.096 - 0.11)	0.10 ± 0.0043 (0.10 - 0.11)	0.0026 ± 0.0055 (-0.0063 - 0.012)	0.675	-0.021,0.026	(0.089 - 0.15) [0.079,0.16]
Manganese (mg/kg DW)	5.79 ± 0.16 (5.18 - 6.07)	5.73 ± 0.19 (5.63 - 5.80)	0.052 ± 0.25 (-0.59 - 0.37)	0.854	-1.01,1.12	(3.86 - 10.47) [2.50,12.03]
Phosphorus (% DW)	0.34 ± 0.012 (0.31 - 0.36)	0.34 ± 0.014 (0.32 - 0.36)	0.00033 ± 0.018 (-0.033 - 0.035)	0.986	-0.077,0.077	(0.27 - 0.39) [0.27,0.42]
Potassium (% DW)	0.35 ± 0.0079 (0.34 - 0.37)	0.37 ± 0.0091 (0.36 - 0.39)	-0.016 ± 0.012 (-0.047 - 0.010)	0.310	-0.068,0.036	(0.32 - 0.45) [0.31,0.45]
Zinc (mg/kg DW)	17.79 ± 0.58 (15.95 - 19.47)	17.93 ± 0.66 (17.87 - 18.00)	-0.14 ± 0.85 (-1.93 - 1.46)	0.888	-3.81,3.54	(13.51 - 27.98) [9.89,31.52]
Proximate						

TABLE 2. Site FS-3 (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Ash (% DW)	1.38 ± 0.074 (1.24 - 1.65)	1.26 ± 0.085 (1.25 - 1.27)	0.12 ± 0.11 (-0.025 - 0.40)	0.399	-0.37,0.61	(1.02 - 1.94) [0.77,2.22]
Carbohydrates (% DW)	83.92 ± 0.19 (83.47 - 84.57)	84.82 ± 0.22 (84.76 - 84.92)	-0.91 ± 0.29 (-1.10 - -0.21)	0.087	-2.14,0.33	(82.18 - 88.14) [79.38,88.91]
Fat, total (% DW)	4.20 ± 0.13 (3.95 - 4.48)	3.71 ± 0.14 (3.38 - 3.84)	0.49 ± 0.13 (0.20 - 0.62)	0.062	-0.064,1.05	(2.57 - 4.95) [1.55,5.75]
Moisture (% FW)	7.70 ± 0.11 (7.53 - 7.82)	7.92 ± 0.13 (7.68 - 8.28)	-0.21 ± 0.17 (-0.63 - 0.14)	0.345	-0.97,0.54	(7.43 - 9.94) [7.06,9.53]
Protein (% DW)	10.50 ± 0.11 (10.23 - 10.72)	10.27 ± 0.12 (10.13 - 10.45)	0.24 ± 0.16 (-0.071 - 0.59)	0.277	-0.46,0.93	(7.77 - 12.99) [6.84,14.57]
Fiber						
Fiber, acid detergent (% DW)	3.05 ± 0.25 (2.63 - 3.74)	2.72 ± 0.27 (2.30 - 3.10)	0.33 ± 0.26 (-0.24 - 0.59)	0.333	-0.80,1.46	(2.46 - 6.33) [1.96,4.71]
Fiber, neutral detergent (% DW)	9.34 ± 0.61 (8.50 - 11.48)	10.04 ± 0.71 (9.35 - 10.95)	-0.70 ± 0.94 (-2.07 - 2.12)	0.531	-4.74,3.33	(8.45 - 14.75) [7.26,14.64]
Miscellaneous						
Phytic Acid (% DW)	0.82 ± 0.037 (0.75 - 0.89)	0.67 ± 0.040 (0.55 - 0.71)	0.15 ± 0.029 (0.094 - 0.20)	0.037	0.022,0.27	(0.48 - 1.12) [0.32,1.18]
Trypsin Inhibitor (TIU/mg DW)	0.79 ± 0.32 (0.54 - 1.53)	0.97 ± 0.33 (0.54 - 2.05)	-0.18 ± 0.17 (-0.52 - -0.0015)	0.390	-0.91,0.54	(0.54 - 4.13) [0,3.63]
Vitamin E (mg/g DW)	0.0053 ± 0.00018 (0.0048 - 0.0058)	0.0057 ± 0.00020 (0.0056 - 0.0059)	-0.00040 ± 0.00027 (-0.00099 - -0.00010)	0.275	-0.0016,0.00076	(0.0027 - 0.015) [0,0.021]

[1]95% tolerance interval to contain 99% of the commercial line population. Negative limits were set to zero.

TABLE 3. Site IT-4 (NK603 vs. Control): Statistical Summary of Corn Forage Proximate and Fiber Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Proximate						
Ash (% DW)	5.18 ± 0.49 (3.85 - 6.44)	5.10 ± 0.49 (3.93 - 5.80)	0.076 ± 0.69 (-1.89 - 1.52)	0.919	-2.11,2.26	(2.43 - 9.64) [0,12.47]
Carbohydrates (% DW)	81.71 ± 0.80 (80.43 - 83.06)	82.78 ± 0.80 (80.64 - 84.77)	-1.07 ± 0.98 (-3.57 - 0.63)	0.354	-4.20,2.05	(76.50 - 87.29) [75.55,91.37]
Fat, total (% DW)	3.07 ± 0.39 (2.06 - 4.49)	2.42 ± 0.39 (2.09 - 2.86)	0.65 ± 0.35 (-0.034 - 1.63)	0.162	-0.47,1.76	(1.42 - 4.57) [0.84,4.80]
Moisture (% FW)	72.20 ± 1.32 (69.90 - 75.20)	69.85 ± 1.32 (66.90 - 72.60)	2.35 ± 1.87 (-2.40 - 8.30)	0.297	-3.60,8.30	(56.50 - 80.40) [45.40,96.42]
Protein (% DW)	10.05 ± 0.40 (9.30 - 10.79)	9.70 ± 0.40 (8.94 - 10.96)	0.35 ± 0.42 (-0.37 - 1.52)	0.470	-1.00,1.70	(4.98 - 11.56) [4.02,12.46]
Fiber						
Fiber, acid detergent (% DW)	24.52 ± 0.89 (23.05 - 26.13)	23.84 ± 0.89 (21.91 - 26.90)	0.68 ± 1.26 (-3.02 - 2.96)	0.627	-3.34,4.70	(17.54 - 38.31) [9.80,44.43]
Fiber, neutral detergent (% DW)	39.46 ± 1.55 (34.12 - 44.35)	38.56 ± 1.55 (37.16 - 39.78)	0.89 ± 2.19 (-3.84 - 7.19)	0.710	-6.07,7.85	(27.93 - 54.75) [20.77,61.87]

[1]95% tolerance interval to contain 99% of the commercial line population. Negative limits were set to zero.

TABLE 4. Site IT-4 (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Amino Acid (% Total AA)						
Alanine (%)	8.03 ± 0.047 (7.87 - 8.18)	7.92 ± 0.047 (7.88 - 7.96)	0.11 ± 0.055 (-0.039 - 0.22)	0.128	-0.060,0.29	(7.38 - 8.13) [7.20,8.35]
Arginine (%)	4.00 ± 0.085 (3.76 - 4.27)	4.26 ± 0.085 (4.09 - 4.35)	-0.26 ± 0.097 (-0.39 - 0.032)	0.077	-0.57,0.053	(3.77 - 4.98) [3.45,5.03]
Aspartic acid (%)	6.33 ± 0.032 (6.27 - 6.37)	6.29 ± 0.032 (6.18 - 6.37)	0.042 ± 0.041 (-0.035 - 0.15)	0.381	-0.089,0.17	(6.02 - 7.51) [5.53,7.61]
Cystine (%)	1.74 ± 0.076 (1.66 - 1.83)	1.89 ± 0.076 (1.61 - 2.09)	-0.15 ± 0.11 (-0.35 - 0.22)	0.257	-0.49,0.19	(1.68 - 2.51) [1.56,2.43]
Glutamic acid (%)	20.28 ± 0.10 (19.92 - 20.62)	19.89 ± 0.10 (19.85 - 19.92)	0.40 ± 0.13 (0.072 - 0.73)	0.060	-0.033,0.82	(18.38 - 20.08) [18.03,20.76]
Glycine (%)	3.32 ± 0.044 (3.23 - 3.39)	3.54 ± 0.044 (3.44 - 3.67)	-0.22 ± 0.041 (-0.31 - -0.12)	0.013	-0.35,-0.085	(3.27 - 4.01) [3.06,4.15]
Histidine (%)	2.64 ± 0.033 (2.56 - 2.71)	2.74 ± 0.033 (2.69 - 2.84)	-0.10 ± 0.032 (-0.18 - -0.027)	0.048	-0.21,-0.00098	(2.58 - 3.15) [2.34,3.36]
Isoleucine (%)	3.80 ± 0.066 (3.62 - 3.97)	3.81 ± 0.066 (3.79 - 3.85)	-0.016 ± 0.083 (-0.17 - 0.16)	0.859	-0.28,0.25	(3.34 - 3.85) [3.35,3.97]
Leucine (%)	14.39 ± 0.098 (14.09 - 14.71)	13.84 ± 0.098 (13.70 - 13.96)	0.55 ± 0.11 (0.27 - 0.76)	0.014	0.21,0.89	(12.18 - 14.34) [11.73,14.76]
Lysine (%)	2.57 ± 0.082 (2.37 - 2.77)	2.70 ± 0.082 (2.56 - 2.94)	-0.13 ± 0.054 (-0.26 - -0.0069)	0.096	-0.30,0.042	(2.58 - 3.67) [2.22,3.68]
Methionine (%)	1.77 ± 0.060 (1.75 - 1.79)	1.90 ± 0.060 (1.67 - 2.06)	-0.13 ± 0.085 (-0.32 - 0.12)	0.213	-0.40,0.14	(1.49 - 2.32) [1.39,2.49]

TABLE 4. Site IT-4 (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Phenylalanine (%)	5.37 ± 0.024 (5.33 - 5.46)	5.24 ± 0.024 (5.20 - 5.28)	0.13 ± 0.035 (0.056 - 0.23)	0.033	0.018,0.24	(4.85 - 5.54) [4.59,5.61]
Proline (%)	9.12 ± 0.090 (8.89 - 9.21)	9.04 ± 0.090 (8.83 - 9.31)	0.083 ± 0.11 (-0.13 - 0.38)	0.513	-0.28,0.44	(8.74 - 9.91) [8.61,10.09]
Serine (%)	4.96 ± 0.047 (4.85 - 5.09)	4.83 ± 0.047 (4.82 - 4.85)	0.13 ± 0.066 (-0.0022 - 0.25)	0.143	-0.080,0.34	(4.41 - 5.22) [4.36,5.19]
Threonine (%)	3.31 ± 0.044 (3.21 - 3.42)	3.25 ± 0.044 (3.15 - 3.34)	0.068 ± 0.062 (-0.083 - 0.22)	0.353	-0.13,0.27	(3.24 - 3.66) [3.14,3.69]
Tryptophan (%)	0.55 ± 0.026 (0.49 - 0.64)	0.59 ± 0.026 (0.57 - 0.62)	-0.037 ± 0.035 (-0.13 - 0.027)	0.367	-0.15,0.074	(0.49 - 0.79) [0.45,0.76]
Tyrosine (%)	3.12 ± 0.31 (2.11 - 3.65)	3.41 ± 0.31 (2.69 - 3.69)	-0.30 ± 0.42 (-1.53 - 0.37)	0.530	-1.64,1.04	(2.32 - 3.90) [3.00,4.03]
Valine (%)	4.70 ± 0.063 (4.55 - 4.85)	4.87 ± 0.063 (4.83 - 4.95)	-0.17 ± 0.072 (-0.30 - -0.0092)	0.095	-0.40,0.056	(4.65 - 5.29) [4.64,5.38]
Fatty Acid (% Total FA)						
16:0 palmitic (%)	9.24 ± 0.045 (9.09 - 9.36)	9.03 ± 0.045 (8.96 - 9.08)	0.20 ± 0.058 (0.071 - 0.32)	0.040	0.016,0.39	(9.12 - 12.62) [7.35,14.72]
18:0 stearic (%)	1.84 ± 0.016 (1.79 - 1.88)	1.79 ± 0.016 (1.78 - 1.81)	0.050 ± 0.023 (-0.015 - 0.10)	0.118	-0.024,0.12	(1.19 - 2.02) [1.02,2.27]
18:1 oleic (%)	24.65 ± 0.31 (24.27 - 24.95)	24.67 ± 0.31 (23.73 - 25.56)	-0.018 ± 0.44 (-0.85 - 1.22)	0.969	-1.42,1.38	(20.21 - 34.64) [12.65,39.86]
18:2 linoleic (%)	62.38 ± 0.35 (61.94 - 62.96)	62.55 ± 0.35 (61.63 - 63.59)	-0.17 ± 0.49 (-1.65 - 0.89)	0.757	-1.74,1.40	(49.72 - 65.98) [44.59,73.50]
18:3 linolenic (%)	1.03 ± 0.013 (0.97 - 1.05)	1.11 ± 0.013 (1.10 - 1.12)	-0.088 ± 0.015 (-0.13 - -0.057)	0.010	-0.14,-0.040	(0.71 - 1.50) [0.54,1.72]

TABLE 4. Site IT-4 (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
20:0 arachidic (%)	0.37 ± 0.0042 (0.36 - 0.39)	0.36 ± 0.0042 (0.36 - 0.37)	0.0093 ± 0.0038 (0.0010 - 0.019)	0.091	-0.0028,0.021	(0.31 - 0.74) [0.17,0.64]
20:1 eicosenoic (%)	0.32 ± 0.0074 (0.30 - 0.34)	0.30 ± 0.0074 (0.29 - 0.31)	0.020 ± 0.010 (-0.0034 - 0.042)	0.148	-0.013,0.053	(0.26 - 0.40) [0.21,0.42]
22:0 behenic (%)	0.18 ± 0.0068 (0.16 - 0.20)	0.19 ± 0.0068 (0.17 - 0.19)	-0.0080 ± 0.0084 (-0.028 - 0.0085)	0.415	-0.035,0.019	(0.073 - 0.22) [0.093,0.24]
Mineral						
Calcium (% DW)	0.0054 ± 0.00016 (0.0052 - 0.0058)	0.0054 ± 0.00016 (0.0050 - 0.0058)	0.00003 ± 0.00022 (-0.00059 - 0.00059)	0.906	-0.00067,0.00073	(0.0039 - 0.0076) [0.0028,0.0082]
Copper (mg/kg DW)	1.88 ± 0.043 (1.82 - 1.98)	1.85 ± 0.043 (1.74 - 1.97)	0.025 ± 0.061 (-0.14 - 0.15)	0.705	-0.17,0.22	(1.16 - 2.78) [0.45,3.16]
Iron (mg/kg DW)	25.96 ± 0.48 (24.70 - 26.91)	24.71 ± 0.48 (24.15 - 25.87)	1.25 ± 0.47 (0.26 - 2.52)	0.075	-0.24,2.75	(15.42 - 29.34) [10.60,33.63]
Magnesium (% DW)	0.13 ± 0.0024 (0.12 - 0.13)	0.12 ± 0.0024 (0.11 - 0.12)	0.0093 ± 0.0034 (-0.00088 - 0.013)	0.071	-0.0015,0.020	(0.089 - 0.15) [0.079,0.16]
Manganese (mg/kg DW)	7.67 ± 0.14 (7.47 - 7.90)	7.11 ± 0.14 (6.61 - 7.32)	0.56 ± 0.16 (0.14 - 0.92)	0.039	0.050,1.07	(3.86 - 10.47) [2.50,12.03]
Phosphorus (% DW)	0.38 ± 0.0065 (0.36 - 0.39)	0.36 ± 0.0065 (0.35 - 0.37)	0.019 ± 0.0093 (-0.0080 - 0.034)	0.127	-0.010,0.049	(0.27 - 0.39) [0.27,0.42]
Potassium (% DW)	0.36 ± 0.0060 (0.34 - 0.38)	0.38 ± 0.0060 (0.37 - 0.39)	-0.024 ± 0.0085 (-0.036 - 0.0027)	0.064	-0.051,0.0028	(0.32 - 0.45) [0.31,0.45]
Zinc (mg/kg DW)	29.76 ± 0.60 (28.81 - 31.45)	28.46 ± 0.60 (27.07 - 29.88)	1.30 ± 0.21 (0.92 - 1.73)	0.008	0.64,1.96	(13.51 - 27.98) [9.89,31.52]
Proximate						

TABLE 4. Site IT-4 (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Ash (% DW)	1.38 ± 0.057 (1.23 - 1.51)	1.40 ± 0.057 (1.29 - 1.50)	-0.016 ± 0.080 (-0.25 - 0.11)	0.853	-0.27,0.24	(1.02 - 1.94) [0.77,2.22]
Carbohydrates (% DW)	80.87 ± 0.28 (80.49 - 81.44)	82.68 ± 0.28 (81.93 - 83.35)	-1.80 ± 0.30 (-2.66 - -1.38)	0.008	-2.75,-0.86	(82.18 - 88.14) [79.38,88.91]
Fat, total (% DW)	4.12 ± 0.10 (3.87 - 4.36)	3.52 ± 0.10 (3.24 - 3.69)	0.60 ± 0.13 (0.26 - 0.82)	0.019	0.18,1.02	(2.57 - 4.95) [1.55,5.75]
Moisture (% FW)	7.55 ± 0.096 (7.34 - 7.71)	7.71 ± 0.096 (7.55 - 8.02)	-0.17 ± 0.14 (-0.68 - 0.16)	0.304	-0.60,0.26	(7.43 - 9.94) [7.06,9.53]
Protein (% DW)	13.63 ± 0.21 (13.32 - 13.92)	12.41 ± 0.21 (11.91 - 13.05)	1.22 ± 0.22 (0.84 - 1.75)	0.011	0.52,1.92	(7.77 - 12.99) [6.84,14.57]
Fiber						
Fiber, acid detergent (% DW)	3.37 ± 0.16 (3.02 - 3.87)	3.27 ± 0.16 (3.04 - 3.68)	0.10 ± 0.099 (-0.19 - 0.27)	0.377	-0.21,0.42	(2.46 - 6.33) [1.96,4.71]
Fiber, neutral detergent (% DW)	10.82 ± 0.43 (9.72 - 12.00)	11.10 ± 0.43 (10.39 - 11.63)	-0.29 ± 0.55 (-1.46 - 1.17)	0.640	-2.04,1.47	(8.45 - 14.75) [7.26,14.64]
Miscellaneous						
Phytic Acid (% DW)	0.75 ± 0.059 (0.51 - 0.87)	0.73 ± 0.059 (0.69 - 0.77)	0.019 ± 0.084 (-0.26 - 0.15)	0.839	-0.25,0.29	(0.48 - 1.12) [0.32,1.18]
Trypsin Inhibitor (TIU/mg DW)	2.34 ± 0.29 (1.98 - 2.57)	1.29 ± 0.29 (0.54 - 2.38)	1.05 ± 0.41 (-0.050 - 2.03)	0.083	-0.25,2.35	(0.54 - 4.13) [0,3.63]
Vitamin E (mg/g DW)	0.0070 ± 0.0015 (0.0046 - 0.0080)	0.0081 ± 0.0015 (0.0050 - 0.014)	-0.0011 ± 0.0020 (-0.0059 - 0.0030)	0.617	-0.0073,0.0052	(0.0027 - 0.015) [0,0.021]

[1]95% tolerance interval to contain 99% of the commercial line population. Negative limits were set to zero.

TABLE 5. Combined Sites (NK603 vs. Control): Statistical Summary of Corn Forage Proximate and Fiber Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Proximate						
Ash (% DW)	4.38 ± 0.75 (2.82 - 6.44)	4.44 ± 0.76 (3.35 - 5.80)	-0.064 ± 0.40 (-1.89 - 1.52)	0.875	-0.94,0.81	(2.43 - 9.64) [0,12.47]
Carbohydrates (% DW)	83.67 ± 1.52 (80.43 - 87.53)	83.65 ± 1.53 (80.64 - 85.52)	0.016 ± 1.12 (-3.57 - 2.50)	0.991	-14.26,14.30	(76.50 - 87.29) [75.55,91.37]
Fat, total (% DW)	3.24 ± 0.47 (2.06 - 4.49)	3.05 ± 0.47 (2.09 - 4.02)	0.19 ± 0.47 (-0.49 - 1.63)	0.758	-5.78,6.16	(1.42 - 4.57) [0.84,4.80]
Moisture (% FW)	67.53 ± 4.16 (61.60 - 75.20)	66.30 ± 4.17 (60.40 - 72.60)	1.23 ± 1.21 (-2.50 - 8.30)	0.495	-14.14,16.60	(56.50 - 80.40) [45.40,96.42]
Protein (% DW)	8.71 ± 1.12 (6.37 - 10.79)	8.86 ± 1.12 (7.03 - 10.96)	-0.15 ± 0.52 (-1.81 - 1.52)	0.825	-6.73,6.43	(4.98 - 11.56) [4.02,12.46]
Fiber						
Fiber, acid detergent (% DW)	23.53 ± 1.47 (19.27 - 26.13)	22.07 ± 1.50 (19.39 - 26.90)	1.46 ± 1.03 (-3.02 - 6.37)	0.180	-0.78,3.71	(17.54 - 38.31) [9.80,44.43]
Fiber, neutral detergent (% DW)	37.34 ± 1.63 (31.77 - 44.35)	37.75 ± 1.68 (34.85 - 41.86)	-0.41 ± 1.43 (-3.84 - 7.19)	0.785	-3.98,3.16	(27.93 - 54.75) [20.77,61.87]

[1]95% tolerance interval to contain 99% of the commercial line population. Negative limits were set to zero.

TABLE 6. Combined Sites (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Amino Acid (% Total AA)						
Alanine (%)	8.04 ± 0.029 (7.87 - 8.18)	7.95 ± 0.031 (7.88 - 8.05)	0.084 ± 0.033 (-0.039 - 0.22)	0.042	0.0040,0.16	(7.38 - 8.13) [7.20,8.35]
Arginine (%)	4.00 ± 0.062 (3.74 - 4.27)	4.27 ± 0.067 (4.09 - 4.36)	-0.26 ± 0.082 (-0.55 - 0.032)	0.019	-0.46,-0.061	(3.77 - 4.98) [3.45,5.03]
Aspartic acid (%)	6.45 ± 0.090 (6.27 - 6.96)	6.28 ± 0.092 (6.18 - 6.37)	0.17 ± 0.12 (-0.035 - 0.64)	0.302	-0.39,0.74	(6.02 - 7.51) [5.53,7.61]
Cystine (%)	1.82 ± 0.062 (1.66 - 1.98)	1.92 ± 0.065 (1.61 - 2.09)	-0.10 ± 0.064 (-0.35 - 0.22)	0.143	-0.24,0.039	(1.68 - 2.51) [1.56,2.43]
Glutamic acid (%)	19.93 ± 0.43 (18.98 - 20.62)	19.40 ± 0.43 (18.69 - 19.92)	0.54 ± 0.17 (-0.043 - 1.39)	0.009	0.16,0.91	(18.38 - 20.08) [18.03,20.76]
Glycine (%)	3.44 ± 0.094 (3.23 - 3.64)	3.60 ± 0.095 (3.44 - 3.77)	-0.16 ± 0.057 (-0.31 - 0.044)	0.216	-0.88,0.56	(3.27 - 4.01) [3.06,4.15]
Histidine (%)	2.65 ± 0.029 (2.56 - 2.74)	2.77 ± 0.030 (2.69 - 2.85)	-0.12 ± 0.027 (-0.22 - -0.027)	0.003	-0.18,-0.056	(2.58 - 3.15) [2.34,3.36]
Isoleucine (%)	3.77 ± 0.048 (3.54 - 3.97)	3.76 ± 0.050 (3.61 - 3.85)	0.0047 ± 0.050 (-0.17 - 0.16)	0.927	-0.11,0.12	(3.34 - 3.85) [3.35,3.97]
Leucine (%)	14.02 ± 0.28 (13.38 - 14.71)	13.69 ± 0.28 (13.27 - 13.96)	0.33 ± 0.22 (-0.40 - 0.76)	0.379	-2.51,3.17	(12.18 - 14.34) [11.73,14.76]
Lysine (%)	2.71 ± 0.14 (2.37 - 3.03)	2.83 ± 0.14 (2.56 - 3.20)	-0.12 ± 0.036 (-0.26 - 0.012)	0.015	-0.21,-0.031	(2.58 - 3.67) [2.22,3.68]
Methionine (%)	1.77 ± 0.033 (1.66 - 1.85)	1.89 ± 0.035 (1.67 - 2.06)	-0.12 ± 0.049 (-0.32 - 0.12)	0.031	-0.22,-0.012	(1.49 - 2.32) [1.39,2.49]

TABLE 6. Combined Sites (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Phenylalanine (%)	5.28 ± 0.065 (5.13 - 5.46)	5.25 ± 0.065 (5.20 - 5.29)	0.034 ± 0.092 (-0.11 - 0.23)	0.748	-0.37,0.43	(4.85 - 5.54) [4.59,5.61]
Proline (%)	9.33 ± 0.17 (8.89 - 9.71)	9.16 ± 0.17 (8.83 - 9.31)	0.17 ± 0.094 (-0.13 - 0.40)	0.317	-1.03,1.37	(8.74 - 9.91) [8.61,10.09]
Serine (%)	4.84 ± 0.11 (4.47 - 5.17)	4.90 ± 0.11 (4.82 - 5.09)	-0.061 ± 0.15 (-0.45 - 0.25)	0.724	-0.73,0.60	(4.41 - 5.22) [4.36,5.19]
Threonine (%)	3.31 ± 0.045 (3.14 - 3.57)	3.29 ± 0.047 (3.15 - 3.50)	0.018 ± 0.049 (-0.15 - 0.22)	0.763	-0.34,0.38	(3.24 - 3.66) [3.14,3.69]
Tryptophan (%)	0.58 ± 0.028 (0.49 - 0.64)	0.62 ± 0.028 (0.57 - 0.69)	-0.036 ± 0.018 (-0.13 - 0.027)	0.090	-0.080,0.0075	(0.49 - 0.79) [0.45,0.76]
Tyrosine (%)	3.24 ± 0.16 (2.11 - 3.65)	3.52 ± 0.18 (2.69 - 3.69)	-0.28 ± 0.23 (-1.53 - 0.37)	0.261	-0.82,0.26	(2.32 - 3.90) [3.00,4.03]
Valine (%)	4.81 ± 0.085 (4.55 - 5.00)	4.90 ± 0.086 (4.74 - 5.04)	-0.094 ± 0.082 (-0.30 - 0.021)	0.455	-1.13,0.95	(4.65 - 5.29) [4.64,5.38]
Fatty Acid (% Total FA)						
16:0 palmitic (%)	8.90 ± 0.24 (8.47 - 9.36)	9.00 ± 0.24 (8.89 - 9.13)	-0.11 ± 0.31 (-0.66 - 0.32)	0.787	-4.03,3.82	(9.12 - 12.62) [7.35,14.72]
18:0 stearic (%)	1.73 ± 0.091 (1.59 - 1.88)	1.74 ± 0.091 (1.67 - 1.81)	-0.010 ± 0.061 (-0.083 - 0.10)	0.892	-0.78,0.76	(1.19 - 2.02) [1.02,2.27]
18:1 oleic (%)	23.80 ± 0.68 (22.82 - 24.95)	24.20 ± 0.68 (23.52 - 25.56)	-0.40 ± 0.39 (-1.16 - 1.22)	0.494	-5.40,4.60	(20.21 - 34.64) [12.65,39.86]
18:2 linoleic (%)	63.73 ± 1.05 (61.94 - 65.25)	63.15 ± 1.05 (61.63 - 64.04)	0.58 ± 0.76 (-1.65 - 1.66)	0.582	-9.03,10.19	(49.72 - 65.98) [44.59,73.50]
18:3 linolenic (%)	1.02 ± 0.020 (0.97 - 1.05)	1.09 ± 0.020 (1.05 - 1.12)	-0.065 ± 0.023 (-0.13 - -0.012)	0.215	-0.36,0.23	(0.71 - 1.50) [0.54,1.72]

TABLE 6. Combined Sites (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
20:0 arachidic (%)	0.36 ± 0.012 (0.34 - 0.39)	0.35 ± 0.012 (0.33 - 0.37)	0.010 ± 0.0024 (0.0010 - 0.019)	0.004	0.0043,0.016	(0.31 - 0.74) [0.17,0.64]
20:1 eicosenoic (%)	0.30 ± 0.012 (0.28 - 0.34)	0.29 ± 0.012 (0.28 - 0.31)	0.013 ± 0.0077 (-0.0034 - 0.042)	0.339	-0.084,0.11	(0.26 - 0.40) [0.21,0.42]
22:0 behenic (%)	0.16 ± 0.015 (0.12 - 0.20)	0.18 ± 0.016 (0.15 - 0.19)	-0.017 ± 0.0091 (-0.034 - 0.0085)	0.318	-0.13,0.099	(0.073 - 0.22) [0.093,0.24]
Mineral						
Calcium (% DW)	0.0053 ± 0.00012 (0.0050 - 0.0058)	0.0053 ± 0.00013 (0.0050 - 0.0058)	-0.00005 ± 0.00015 (-0.00059 - 0.00059)	0.764	-0.00037,0.00028	(0.0039 - 0.0076) [0.0028,0.0082]
Copper (mg/kg DW)	1.89 ± 0.032 (1.77 - 1.99)	1.83 ± 0.034 (1.69 - 1.97)	0.054 ± 0.046 (-0.15 - 0.27)	0.265	-0.046,0.15	(1.16 - 2.78) [0.45,3.16]
Iron (mg/kg DW)	22.73 ± 3.07 (17.43 - 26.91)	21.81 ± 3.08 (18.52 - 25.87)	0.92 ± 0.50 (-1.32 - 2.63)	0.105	-0.25,2.10	(15.42 - 29.34) [10.60,33.63]
Magnesium (% DW)	0.12 ± 0.0076 (0.096 - 0.13)	0.11 ± 0.0076 (0.10 - 0.12)	0.0062 ± 0.0033 (-0.0063 - 0.013)	0.308	-0.035,0.048	(0.089 - 0.15) [0.079,0.16]
Manganese (mg/kg DW)	6.73 ± 0.83 (5.18 - 7.90)	6.42 ± 0.83 (5.63 - 7.32)	0.31 ± 0.26 (-0.59 - 0.92)	0.440	-2.96,3.58	(3.86 - 10.47) [2.50,12.03]
Phosphorus (% DW)	0.36 ± 0.016 (0.31 - 0.39)	0.35 ± 0.016 (0.32 - 0.37)	0.010 ± 0.0097 (-0.033 - 0.035)	0.479	-0.11,0.13	(0.27 - 0.39) [0.27,0.42]
Potassium (% DW)	0.36 ± 0.0046 (0.34 - 0.38)	0.38 ± 0.0049 (0.36 - 0.39)	-0.021 ± 0.0068 (-0.047 - 0.010)	0.008	-0.035,-0.0062	(0.32 - 0.45) [0.31,0.45]
Zinc (mg/kg DW)	23.78 ± 5.63 (15.95 - 31.45)	23.21 ± 5.63 (17.87 - 29.88)	0.56 ± 0.76 (-1.93 - 1.73)	0.594	-9.11,10.24	(13.51 - 27.98) [9.89,31.52]
Proximate						

TABLE 6. Combined Sites (NK603 vs. Control): Statistical Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Difference(NK603 minus Control) Mean ± S.E. (Range)	p-value	95% CI (Lower,Upper)	Commercial (Range) [95% Tolerance Int.[1]]
Ash (% DW)	1.38 ± 0.046 (1.23 - 1.65)	1.34 ± 0.049 (1.25 - 1.50)	0.042 ± 0.067 (-0.25 - 0.40)	0.543	-0.10,0.19	(1.02 - 1.94) [0.77,2.22]
Carbohydrates (% DW)	82.39 ± 1.31 (80.49 - 84.57)	83.73 ± 1.31 (81.93 - 84.92)	-1.34 ± 0.48 (-2.66 - -0.21)	0.218	-7.39,4.72	(82.18 - 88.14) [79.38,88.91]
Fat, total (% DW)	4.16 ± 0.078 (3.87 - 4.48)	3.60 ± 0.083 (3.24 - 3.84)	0.57 ± 0.092 (0.20 - 0.82)	<0.001	0.34,0.79	(2.57 - 4.95) [1.55,5.75]
Moisture (% FW)	7.62 ± 0.10 (7.34 - 7.82)	7.81 ± 0.11 (7.55 - 8.28)	-0.18 ± 0.10 (-0.68 - 0.16)	0.101	-0.41,0.042	(7.43 - 9.94) [7.06,9.53]
Protein (% DW)	12.07 ± 1.34 (10.23 - 13.92)	11.34 ± 1.34 (10.13 - 13.05)	0.72 ± 0.50 (-0.071 - 1.75)	0.385	-5.64,7.09	(7.77 - 12.99) [6.84,14.57]
Fiber						
Fiber, acid detergent (% DW)	3.21 ± 0.21 (2.63 - 3.87)	3.03 ± 0.21 (2.30 - 3.68)	0.18 ± 0.11 (-0.24 - 0.59)	0.161	-0.095,0.45	(2.46 - 6.33) [1.96,4.71]
Fiber, neutral detergent (% DW)	10.08 ± 0.69 (8.50 - 12.00)	10.57 ± 0.70 (9.35 - 11.63)	-0.49 ± 0.52 (-2.07 - 2.12)	0.362	-1.63,0.64	(8.45 - 14.75) [7.26,14.64]
Miscellaneous						
Phytic Acid (% DW)	0.79 ± 0.036 (0.51 - 0.89)	0.70 ± 0.038 (0.55 - 0.77)	0.087 ± 0.052 (-0.26 - 0.20)	0.120	-0.026,0.20	(0.48 - 1.12) [0.32,1.18]
Trypsin Inhibitor (TIU/mg DW)	1.56 ± 0.56 (0.54 - 2.57)	1.15 ± 0.57 (0.54 - 2.38)	0.41 ± 0.64 (-0.52 - 2.03)	0.635	-7.74,8.57	(0.54 - 4.13) [0,3.63]
Vitamin E (mg/g DW)	0.0062 ± 0.0011 (0.0046 - 0.0080)	0.0070 ± 0.0011 (0.0050 - 0.014)	-0.00083 ± 0.0010 (-0.0059 - 0.0030)	0.433	-0.0032,0.0015	(0.0027 - 0.015) [0,0.021]

[1]95% tolerance interval to contain 99% of the commercial line population. Negative limits were set to zero.

Table 7. Summary of Analytes with a Significant Comparison ($p<0.05$)

Location	Tissue	Category	Component	NK603 vs. Control
Site FS-3	Grain	Amino Acid (% Total AA)	Proline	0.033
			Tryptophan	0.047
		Fatty Acid (% Total FA)	16:0 palmitic	0.034
			18:0 stearic	0.019
			18:1 oleic	0.027
			18:2 linoleic	0.013
		Miscellaneous	Phytic Acid	0.037
Site IT-4	Grain	Amino Acid (% Total AA)	Glycine	0.013
			Histidine	0.048
			Leucine	0.014
			Phenylalanine	0.033
		Fatty Acid (% Total FA)	16:0 palmitic	0.040
			18:3 linolenic	0.010
		Mineral	Manganese	0.039
			Zinc	0.008
		Proximate	Carbohydrates	0.008
			Fat, total	0.019
			Protein	0.011
Combined Sites	Grain	Amino Acid (% Total AA)	Alanine	0.042
			Arginine	0.019
			Glutamic acid	0.009
			Histidine	0.003
			Lysine	0.015
			Methionine	0.031
		Fatty Acid (% Total FA)	20:0 arachidic	0.004
		Mineral	Potassium	0.008
		Proximate	Fat, total	<0.001

TABLE 8. Site FN-1 NK603 and Control: Summary of Corn Forage Proximate and Fiber Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Commercial (Range) [95% Tolerance Int.[1]]
Proximate			
Ash (% DW)	5.20 ± 0.23 (4.61 - 5.70)	6.54 ± 0.51 (5.69 - 8.01)	(2.43 - 9.64) [0,12.47]
Carbohydrates (% DW)	84.68 ± 0.51 (83.29 - 85.55)	82.70 ± 1.98 (77.65 - 87.13)	(76.50 - 87.29) [75.55,91.37]
Fat, total (% DW)	2.19 ± 0.47 (1.42 - 3.54)	2.59 ± 0.46 (1.58 - 3.61)	(1.42 - 4.57) [0.84,4.80]
Moisture (% FW)	78.23 ± 0.83 (75.80 - 79.60)	76.38 ± 0.42 (75.40 - 77.40)	(56.50 - 80.40) [45.40,96.42]
Protein (% DW)	7.94 ± 0.49 (6.62 - 8.97)	8.17 ± 1.17 (5.61 - 11.26)	(4.98 - 11.56) [4.02,12.46]
Fiber			
Fiber, acid detergent (% DW)	29.55 ± 0.69 (28.14 - 31.23)	28.17 ± 0.87 (26.32 - 30.35)	(17.54 - 38.31) [9.80,44.43]
Fiber, neutral detergent (% DW)	44.95 ± 1.57 (40.95 - 48.36)	42.43 ± 1.45 (39.75 - 46.46)	(27.93 - 54.75) [20.77,61.87]

[1]95% tolerance interval to contain 99% of the commercial line population. Negative limits were set to zero.

TABLE 9. Site FN-1 NK603 and Control: Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Commercial (Range) [95% Tolerance Int.[1]]
Amino Acid (% Total AA)			
Alanine (%)	8.01 ± 0.052 (7.88 - 8.11)	7.88 ± 0.039 (7.77 - 7.95)	(7.38 - 8.13) [7.20,8.35]
Arginine (%)	3.64 ± 0.087 (3.47 - 3.88)	3.85 ± 0.14 (3.64 - 4.24)	(3.77 - 4.98) [3.45,5.03]
Aspartic acid (%)	6.70 ± 0.093 (6.50 - 6.93)	6.84 ± 0.11 (6.56 - 7.08)	(6.02 - 7.51) [5.53,7.61]
Cystine (%)	1.76 ± 0.060 (1.59 - 1.88)	1.82 ± 0.052 (1.69 - 1.95)	(1.68 - 2.51) [1.56,2.43]
Glutamic acid (%)	20.31 ± 0.098 (20.02 - 20.43)	20.10 ± 0.12 (19.81 - 20.40)	(18.38 - 20.08) [18.03,20.76]
Glycine (%)	3.16 ± 0.058 (3.07 - 3.31)	3.27 ± 0.052 (3.13 - 3.36)	(3.27 - 4.01) [3.06,4.15]
Histidine (%)	2.52 ± 0.029 (2.46 - 2.60)	2.60 ± 0.025 (2.54 - 2.65)	(2.58 - 3.15) [2.34,3.36]
Isoleucine (%)	3.79 ± 0.041 (3.68 - 3.88)	3.83 ± 0.016 (3.80 - 3.87)	(3.34 - 3.85) [3.35,3.97]
Leucine (%)	14.34 ± 0.15 (14.01 - 14.60)	13.98 ± 0.16 (13.60 - 14.37)	(12.18 - 14.34) [11.73,14.76]
Lysine (%)	2.60 ± 0.12 (2.35 - 2.91)	2.69 ± 0.088 (2.43 - 2.82)	(2.58 - 3.67) [2.22,3.68]
Methionine (%)	1.79 ± 0.038 (1.68 - 1.85)	1.86 ± 0.054 (1.75 - 2.00)	(1.49 - 2.32) [1.39,2.49]
Phenylalanine (%)	5.31 ± 0.034	5.22 ± 0.029	(4.85 - 5.54)

TABLE 9. Site FN-1 NK603 and Control: Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Commercial (Range) [95% Tolerance Int.[1]]
	(5.21 - 5.36)	(5.14 - 5.28)	[4.59,5.61]
Proline (%)	9.02 ± 0.074 (8.88 - 9.16)	9.08 ± 0.11 (8.88 - 9.40)	(8.74 - 9.91) [8.61,10.09]
Serine (%)	4.81 ± 0.11 (4.61 - 5.14)	4.69 ± 0.023 (4.62 - 4.72)	(4.41 - 5.22) [4.36,5.19]
Threonine (%)	3.23 ± 0.049 (3.10 - 3.34)	3.20 ± 0.032 (3.12 - 3.27)	(3.24 - 3.66) [3.14,3.69]
Tryptophan (%)	0.50 ± 0.010 (0.48 - 0.53)	0.56 ± 0.024 (0.51 - 0.60)	(0.49 - 0.79) [0.45,0.76]
Tyrosine (%)	3.71 ± 0.024 (3.65 - 3.76)	3.68 ± 0.018 (3.64 - 3.73)	(2.32 - 3.90) [3.00,4.03]
Valine (%)	4.82 ± 0.058 (4.65 - 4.91)	4.87 ± 0.028 (4.79 - 4.92)	(4.65 - 5.29) [4.64,5.38]
Fatty Acid (% Total FA)			
16:0 palmitic (%)	8.50 ± 0.062 (8.38 - 8.67)	8.63 ± 0.046 (8.57 - 8.77)	(9.12 - 12.62) [7.35,14.72]
18:0 stearic (%)	1.43 ± 0.053 (1.28 - 1.52)	1.48 ± 0.015 (1.45 - 1.52)	(1.19 - 2.02) [1.02,2.27]
18:1 oleic (%)	20.88 ± 0.12 (20.56 - 21.10)	21.22 ± 0.10 (20.97 - 21.46)	(20.21 - 34.64) [12.65,39.86]
18:2 linoleic (%)	67.38 ± 0.23 (67.00 - 68.02)	66.80 ± 0.14 (66.40 - 67.04)	(49.72 - 65.98) [44.59,73.50]
18:3 linolenic (%)	1.03 ± 0.0093 (1.01 - 1.05)	1.06 ± 0.015 (1.02 - 1.09)	(0.71 - 1.50) [0.54,1.72]
20:0 arachidic (%)	0.37 ± 0.0015	0.36 ± 0.0027	(0.31 - 0.74)

TABLE 9. Site FN-1 NK603 and Control: Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Commercial (Range) [95% Tolerance Int.[1]]
	(0.36 - 0.37)	(0.36 - 0.37)	[0.17,0.64]
20:1 eicosenoic (%)	0.30 ± 0.0033 (0.29 - 0.31)	0.31 ± 0.0023 (0.30 - 0.31)	(0.26 - 0.40) [0.21,0.42]
22:0 behenic (%)	0.12 ± 0.023 (0.052 - 0.15)	0.15 ± 0.0048 (0.14 - 0.16)	(0.073 - 0.22) [0.093,0.24]
Mineral			
Calcium (% DW)	0.0077 ± 0.00006 (0.0076 - 0.0079)	0.0076 ± 0.00017 (0.0072 - 0.0079)	(0.0039 - 0.0076) [0.0028,0.0082]
Copper (mg/kg DW)	1.75 ± 0.052 (1.66 - 1.90)	1.72 ± 0.032 (1.66 - 1.78)	(1.16 - 2.78) [0.45,3.16]
Iron (mg/kg DW)	19.91 ± 0.49 (18.96 - 21.21)	20.65 ± 1.07 (17.99 - 23.12)	(15.42 - 29.34) [10.60,33.63]
Magnesium (% DW)	0.12 ± 0.0017 (0.12 - 0.13)	0.13 ± 0.0043 (0.11 - 0.13)	(0.089 - 0.15) [0.079,0.16]
Manganese (mg/kg DW)	7.81 ± 0.22 (7.36 - 8.25)	8.26 ± 0.31 (7.35 - 8.69)	(3.86 - 10.47) [2.50,12.03]
Phosphorus (% DW)	0.38 ± 0.0023 (0.37 - 0.38)	0.38 ± 0.012 (0.35 - 0.40)	(0.27 - 0.39) [0.27,0.42]
Potassium (% DW)	0.43 ± 0.0050 (0.42 - 0.44)	0.46 ± 0.016 (0.41 - 0.49)	(0.32 - 0.45) [0.31,0.45]
Zinc (mg/kg DW)	24.23 ± 0.23 (23.81 - 24.69)	24.74 ± 0.84 (22.68 - 26.43)	(13.51 - 27.98) [9.89,31.52]
Proximate			
Ash (% DW)	1.80 ± 0.021 (1.76 - 1.86)	1.85 ± 0.043 (1.80 - 1.98)	(1.02 - 1.94) [0.77,2.22]

TABLE 9. Site FN-1 NK603 and Control: Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Commercial (Range) [95% Tolerance Int.[1]]
Carbohydrates (% DW)	79.84 ± 0.39 (78.90 - 80.79)	80.54 ± 0.29 (79.98 - 81.28)	(82.18 - 88.14) [79.38,88.91]
Fat, total (% DW)	4.28 ± 0.068 (4.11 - 4.44)	3.78 ± 0.068 (3.60 - 3.93)	(2.57 - 4.95) [1.55,5.75]
Moisture (% FW)	8.16 ± 0.074 (8.02 - 8.34)	8.13 ± 0.10 (7.87 - 8.33)	(7.43 - 9.94) [7.06,9.53]
Protein (% DW)	14.07 ± 0.34 (13.29 - 14.90)	13.82 ± 0.28 (13.08 - 14.29)	(7.77 - 12.99) [6.84,14.57]
Fiber			
Fiber, acid detergent (% DW)	3.37 ± 0.087 (3.18 - 3.60)	3.44 ± 0.13 (3.22 - 3.82)	(2.46 - 6.33) [1.96,4.71]
Fiber, neutral detergent (% DW)	10.89 ± 0.39 (9.83 - 11.67)	11.95 ± 0.22 (11.42 - 12.48)	(8.45 - 14.75) [7.26,14.64]
Miscellaneous			
Phytic Acid (% DW)	0.95 ± 0.029 (0.90 - 1.01)	1.03 ± 0.068 (0.83 - 1.12)	(0.48 - 1.12) [0.32,1.18]
Trypsin Inhibitor (TIU/mg DW)	2.35 ± 0.068 (2.16 - 2.47)	2.01 ± 0.19 (1.71 - 2.56)	(0.54 - 4.13) [0,3.63]
Vitamin E (mg/g DW)	0.0060 ± 0.00018 (0.0055 - 0.0064)	0.0061 ± 0.00015 (0.0057 - 0.0064)	(0.0027 - 0.015) [0,0.021]

[1]95% tolerance interval to contain 99% of the commercial line population. Negative limits were set to zero.

TABLE 10. Site FN-2 NK603 and Control: Summary of Corn Forage Proximate and Fiber Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Commercial (Range) [95% Tolerance Int.[1]]
Proximate			
Ash (% DW)	5.37 ± 0.12 (5.13 - 5.62)	5.73 ± 0.43 (4.88 - 6.89)	(2.43 - 9.64) [0,12.47]
Carbohydrates (% DW)	83.07 ± 0.44 (82.25 - 84.31)	82.48 ± 0.22 (81.85 - 82.80)	(76.50 - 87.29) [75.55,91.37]
Fat, total (% DW)	2.98 ± 0.25 (2.46 - 3.46)	2.30 ± 0.34 (1.70 - 3.28)	(1.42 - 4.57) [0.84,4.80]
Moisture (% FW)	78.40 ± 0.48 (77.60 - 79.80)	79.38 ± 0.73 (77.80 - 81.30)	(56.50 - 80.40) [45.40,96.42]
Protein (% DW)	8.58 ± 0.34 (7.82 - 9.18)	9.49 ± 0.40 (8.60 - 10.19)	(4.98 - 11.56) [4.02,12.46]
Fiber			
Fiber, acid detergent (% DW)	25.37 ± 1.21 (22.19 - 27.90)	26.79 ± 1.30 (22.99 - 28.78)	(17.54 - 38.31) [9.80,44.43]
Fiber, neutral detergent (% DW)	42.36 ± 1.93 (36.78 - 45.62)	37.94 ± 1.43 (33.90 - 40.47)	(27.93 - 54.75) [20.77,61.87]

[1]95% tolerance interval to contain 99% of the commercial line population. Negative limits were set to zero.

TABLE 11. Site FN-2 NK603 and Control: Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Commercial (Range) [95% Tolerance Int.[1]]
Amino Acid (% Total AA)			
Alanine (%)	8.06 ± 0.050 (7.93 - 8.16)	7.99 ± 0.040 (7.88 - 8.06)	(7.38 - 8.13) [7.20,8.35]
Arginine (%)	3.64 ± 0.061 (3.49 - 3.76)	3.74 ± 0.068 (3.66 - 3.94)	(3.77 - 4.98) [3.45,5.03]
Aspartic acid (%)	6.97 ± 0.019 (6.94 - 7.02)	6.79 ± 0.066 (6.61 - 6.92)	(6.02 - 7.51) [5.53,7.61]
Cystine (%)	1.57 ± 0.093 (1.31 - 1.74)	1.72 ± 0.013 (1.69 - 1.75)	(1.68 - 2.51) [1.56,2.43]
Glutamic acid (%)	20.42 ± 0.092 (20.15 - 20.56)	20.29 ± 0.11 (19.99 - 20.54)	(18.38 - 20.08) [18.03,20.76]
Glycine (%)	3.07 ± 0.017 (3.03 - 3.11)	3.15 ± 0.056 (3.04 - 3.30)	(3.27 - 4.01) [3.06,4.15]
Histidine (%)	2.45 ± 0.012 (2.43 - 2.48)	2.52 ± 0.021 (2.48 - 2.57)	(2.58 - 3.15) [2.34,3.36]
Isoleucine (%)	3.91 ± 0.055 (3.79 - 4.05)	3.86 ± 0.071 (3.65 - 3.97)	(3.34 - 3.85) [3.35,3.97]
Leucine (%)	14.43 ± 0.049 (14.34 - 14.55)	14.26 ± 0.10 (13.97 - 14.45)	(12.18 - 14.34) [11.73,14.76]
Lysine (%)	2.53 ± 0.051 (2.39 - 2.64)	2.59 ± 0.047 (2.48 - 2.70)	(2.58 - 3.67) [2.22,3.68]
Methionine (%)	1.82 ± 0.078 (1.62 - 2.00)	1.82 ± 0.011 (1.80 - 1.85)	(1.49 - 2.32) [1.39,2.49]
Phenylalanine (%)	5.32 ± 0.0090	5.27 ± 0.025	(4.85 - 5.54)

TABLE 11. Site FN-2 NK603 and Control: Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Commercial (Range) [95% Tolerance Int.[1]]
	(5.30 - 5.34)	(5.21 - 5.33)	[4.59,5.61]
Proline (%)	8.98 ± 0.10 (8.75 - 9.18)	9.18 ± 0.060 (9.10 - 9.35)	(8.74 - 9.91) [8.61,10.09]
Serine (%)	4.64 ± 0.12 (4.43 - 4.98)	4.64 ± 0.11 (4.41 - 4.93)	(4.41 - 5.22) [4.36,5.19]
Threonine (%)	3.18 ± 0.031 (3.12 - 3.27)	3.22 ± 0.082 (3.11 - 3.46)	(3.24 - 3.66) [3.14,3.69]
Tryptophan (%)	0.58 ± 0.018 (0.55 - 0.62)	0.53 ± 0.0044 (0.52 - 0.54)	(0.49 - 0.79) [0.45,0.76]
Tyrosine (%)	3.50 ± 0.16 (3.01 - 3.71)	3.60 ± 0.11 (3.27 - 3.73)	(2.32 - 3.90) [3.00,4.03]
Valine (%)	4.91 ± 0.045 (4.81 - 5.03)	4.84 ± 0.056 (4.67 - 4.90)	(4.65 - 5.29) [4.64,5.38]
Fatty Acid (% Total FA)			
16:0 palmitic (%)	8.38 ± 0.067 (8.22 - 8.49)	8.36 ± 0.045 (8.24 - 8.44)	(9.12 - 12.62) [7.35,14.72]
18:0 stearic (%)	1.36 ± 0.013 (1.32 - 1.38)	1.34 ± 0.013 (1.32 - 1.37)	(1.19 - 2.02) [1.02,2.27]
18:1 oleic (%)	20.83 ± 0.13 (20.44 - 21.04)	21.05 ± 0.23 (20.53 - 21.56)	(20.21 - 34.64) [12.65,39.86]
18:2 linoleic (%)	67.54 ± 0.20 (67.15 - 68.03)	67.38 ± 0.19 (66.87 - 67.68)	(49.72 - 65.98) [44.59,73.50]
18:3 linolenic (%)	1.06 ± 0.013 (1.03 - 1.09)	1.05 ± 0.038 (1.01 - 1.17)	(0.71 - 1.50) [0.54,1.72]
20:0 arachidic (%)	0.38 ± 0.0039	0.36 ± 0.0053	(0.31 - 0.74)

TABLE 11. Site FN-2 NK603 and Control: Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Commercial (Range) [95% Tolerance Int.[1]]
	(0.37 - 0.39)	(0.35 - 0.38)	[0.17,0.64]
20:1 eicosenoic (%)	0.31 ± 0.0019 (0.30 - 0.31)	0.31 ± 0.0030 (0.30 - 0.32)	(0.26 - 0.40) [0.21,0.42]
22:0 behenic (%)	0.15 ± 0.0057 (0.14 - 0.16)	0.15 ± 0.0067 (0.14 - 0.17)	(0.073 - 0.22) [0.093,0.24]
Mineral			
Calcium (% DW)	0.0094 ± 0.00038 (0.0085 - 0.010)	0.0098 ± 0.00068 (0.0080 - 0.011)	(0.0039 - 0.0076) [0.0028,0.0082]
Copper (mg/kg DW)	1.90 ± 0.060 (1.75 - 2.05)	1.80 ± 0.064 (1.64 - 1.92)	(1.16 - 2.78) [0.45,3.16]
Iron (mg/kg DW)	23.31 ± 0.39 (22.37 - 24.24)	23.24 ± 0.84 (20.91 - 24.90)	(15.42 - 29.34) [10.60,33.63]
Magnesium (% DW)	0.15 ± 0.0036 (0.14 - 0.15)	0.13 ± 0.0018 (0.12 - 0.13)	(0.089 - 0.15) [0.079,0.16]
Manganese (mg/kg DW)	9.70 ± 0.51 (8.33 - 10.82)	9.25 ± 0.41 (8.76 - 10.46)	(3.86 - 10.47) [2.50,12.03]
Phosphorus (% DW)	0.44 ± 0.0097 (0.41 - 0.45)	0.39 ± 0.0050 (0.38 - 0.41)	(0.27 - 0.39) [0.27,0.42]
Potassium (% DW)	0.54 ± 0.021 (0.48 - 0.57)	0.51 ± 0.013 (0.47 - 0.53)	(0.32 - 0.45) [0.31,0.45]
Zinc (mg/kg DW)	26.26 ± 0.81 (23.88 - 27.52)	26.23 ± 0.82 (24.13 - 27.74)	(13.51 - 27.98) [9.89,31.52]
Proximate			
Ash (% DW)	2.21 ± 0.066 (2.03 - 2.35)	2.02 ± 0.074 (1.83 - 2.16)	(1.02 - 1.94) [0.77,2.22]

TABLE 11. Site FN-2 NK603 and Control: Summary of Corn Grain Amino Acid, Fatty Acid, Mineral, Proximate, Fiber, Phytic Acid, Trypsin Inhibitor and Vitamin E Content

Component	NK603 Mean ± S.E. (Range)	Control Mean ± S.E. (Range)	Commercial (Range) [95% Tolerance Int.[1]]
Carbohydrates (% DW)	77.29 ± 0.32 (76.50 - 78.07)	78.64 ± 0.48 (77.40 - 79.70)	(82.18 - 88.14) [79.38,88.91]
Fat, total (% DW)	3.82 ± 0.048 (3.73 - 3.96)	3.61 ± 0.019 (3.57 - 3.65)	(2.57 - 4.95) [1.55,5.75]
Moisture (% FW)	7.64 ± 0.15 (7.44 - 8.07)	8.02 ± 0.16 (7.72 - 8.43)	(7.43 - 9.94) [7.06,9.53]
Protein (% DW)	16.67 ± 0.22 (16.10 - 17.19)	15.74 ± 0.46 (14.75 - 16.87)	(7.77 - 12.99) [6.84,14.57]
Fiber			
Fiber, acid detergent (% DW)	4.13 ± 0.47 (3.47 - 5.52)	4.52 ± 0.17 (4.23 - 4.96)	(2.46 - 6.33) [1.96,4.71]
Fiber, neutral detergent (% DW)	12.51 ± 0.55 (11.35 - 13.53)	16.25 ± 0.94 (14.69 - 18.53)	(8.45 - 14.75) [7.26,14.64]
Miscellaneous			
Phytic Acid (% DW)	1.01 ± 0.048 (0.87 - 1.07)	0.88 ± 0.075 (0.72 - 1.01)	(0.48 - 1.12) [0.32,1.18]
Trypsin Inhibitor (TIU/mg DW)	0.83 ± 0.29 (0.54 - 1.69)	1.27 ± 0.070 (1.09 - 1.40)	(0.54 - 4.13) [0,3.63]
Vitamin E (mg/g DW)	0.0052 ± 0.00042 (0.0045 - 0.0064)	0.0056 ± 0.00025 (0.0050 - 0.0062)	(0.0027 - 0.015) [0,0.021]

[1]95% tolerance interval to contain 99% of the commercial line population. Negative limits were set to zero.

Listing 1. Analytes Excluded from Summary and Analysis Due to Excessive Observations at or Below the Assay Detection Limit

Tissue	Analyte	(N) Below D.L.	(N) Total	(%)
Grain	10:0 capric	109	109	100.0
	12:0 lauric	109	109	100.0
	14:0 myristic	109	109	100.0
	14:1 myristoleic	109	109	100.0
	15:0 pentadecanoic	109	109	100.0
	15:1 pentadecenoic	109	109	100.0
	16:1 palmitoleic	82	109	75.2
	17:0 heptadecanoic	109	109	100.0
	17:1 heptadecenoic	109	109	100.0
	18:3 gamma linolenic	109	109	100.0
	20:2 eicosadienoic	104	109	95.4
	20:3 eicosatrienoic	109	109	100.0
	20:4 arachidonic	109	109	100.0
	8:0 caprylic	109	109	100.0
	Sodium	102	109	93.6