

Study Title

**Amended Report for MSL0022167: Composition Analyses of Soybean Seed, Meal, Oil, Protein Isolate, and Lecithin Derived from MON 87705 Produced in the United States during the 2007 Field Season**

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Study Completed On

**Amendment 2  
May 11, 2010**

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Laboratory Project ID

**MSL0022708  
Monsanto Study No. REG-08-144  
Covance Study No. 6103-749**

**The text below applies only to use of the data by the United States Environmental Protection Agency (U.S. EPA) in connection with the provisions of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).**

**The inclusion of this page in all studies is for quality assurance purposes and does not necessarily indicate that this study has been submitted to the U.S. EPA.**

**Statement of No Data Confidentiality Claim**

No claim of data confidentiality is made for any information contained in this study on the basis of its falling within the scope of FIFRA § 10(d)(1)(A), (B), or (C).

We submit this material to the U. S. EPA specifically under the requirements set forth in FIFRA as amended, and consent to the use and disclosure of this material by the EPA strictly in accordance with FIFRA. By submitting this material to the EPA in accordance with the method and format requirements contained in PR Notice 86-5, we reserve and do not waive any rights involving this material that are or can be claimed by the company notwithstanding this submission to the EPA.

**Monsanto Company**

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Company

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Company Agent

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Title

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Signature

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Date

Amended

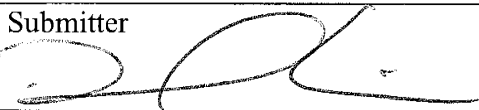
### Statement of Compliance

This study meets the U.S. EPA Good Laboratory Practice requirements as specified in 40 CFR Part 160 with the following exceptions:

- The reference standards used for compositional analysis were not listed in the protocol, characterized according to GLP standards, and a reserve sample from each batch was not retained. These exceptions had no effect on the integrity or quality of the study because the reference standards were certified, and the standards were listed in the analytical sub-report.
- Stability of the compositional analytes in the test and control, and reference substances was not determined. This exception had no effect on the integrity or quality of the study because the samples were maintained at approximately -20°C throughout the duration of the study.

Submitter

Date



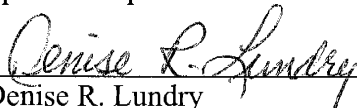
5/11/10

Biotechnology Regulatory Affairs, Food and Nutrition Program

Date

Daniel J. Jenkins

Sponsor Representative



5/11/2010

Denise R. Lundry

Date

Study Director

Amended

### Quality Assurance Statement

Study Title: Amended Report for MSL0022167: Composition Analyses of Soybean Seed, Meal, Oil, Protein Isolate, and Lecithin Derived from MON 87705 Produced in the United States During the 2007 Field Season

Study Number: REG-08-144

Reviews conducted by the Quality Assurance Unit confirm that the final report reflects the raw data for the portion of the study conducted by Monsanto Company, Biotechnology Regulatory Sciences.

Reviews that have been conducted by Covance Laboratories Inc., are enclosed within the Covance Laboratories Inc. Analytical Sub-report and are specified on their individual QA Statement.

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

Dates of Inspection / Audit	Phase	Date Reported To:	
		Study Director	Management
08/22/2008	Statistical Data and Draft Report Review	08/26/2008	08/26/2008
01/14/2009	Draft Report and Data Audit	01/27/2009	01/27/2009
01/14/2009	Statistical Data and Draft Report Review	01/14/2009	01/14/2009
07/22/2009	Amended Report Review	07/23/2009	07/23/2009
05/07/2010	Amended Report Review	05/10/2010	05/10/2010

Patricia Thomas  
Quality Assurance Unit  
Monsanto Regulatory, Monsanto Company

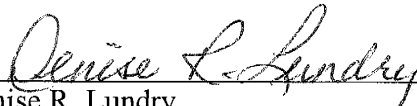
05-11-2010  
Date

Amended

### Study Certification

This report is an accurate and complete representation of the study/project activities.

### Signature of Final Report Approval:

  
\_\_\_\_\_  
Denise R. Lundry  
Study Director

  
\_\_\_\_\_  
Date

Amended

### Study Information

**Report Number:** MSL0022708

**Study Number:** REG-08-144

**Study Title:** Amended Report for MSL0022167: Composition Analyses of Soybean Seed, Meal, Oil, Protein Isolate, and Lecithin Derived from MON 87705 Produced in the United States during the 2007 Field Season

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**Study Initiation Date:** April 18, 2008

**Study Completion Date:**  
Original Study      February 25, 2009  
Amended Study      May 11, 2010

**Records Retention:** Study-specific raw data, protocol documents, and the final report are retained in the Regulatory Archive at Monsanto Company, St. Louis, Missouri. Analytical raw data and facility records are maintained in the Archive at Covance Laboratories Inc., Madison, Wisconsin.

### Study Information (continued)

**Sample Storage:** Unused study samples will be stored at Covance Laboratories Inc. until their final disposition is directed by the Study Director at a future date.

#### Amendment to Report MSL0022167

This amendment corrects the year cited for the Berman, et al reference in the list of references (Section 10.0). The new MSL number was added to the header of each page of the final report. These changes improve the accuracy of the report and have no negative impact on the study.

Item No.	MSL0022167 Amendment 1 Report	MSL0022708 Amendment 2 Report	Amendment
1	Title Page	Title Page	Changed title to "Amended Report for MSL0022167..."; added "Amendment 2" after "Study Completed On" and revised the study completion date. Laboratory Project ID MSL number changed to MSL0022708.
3	Page 2-5	Page 2-5	Added new signatures and dates.
4	Page 4	Page 4	Changed title to "Amended Report for MSL0022167..."; added "Amended Report Review" and appropriate dates to list of phases.
5	Page 6	Page 6	Report number changed to MSL0022708. Changed title to "Amended Report for MSL0022167..."; added "Original Study" and "Amended Study" to "Study Completed Date", and added Amended Study completion date.
6	Page 7	Page 7	Added Amendment to Report MSL0022167 and added list of changes.
7	Page 12, 14, 18, 22, 27	Page 12, 14, 18, 22, 27	Year cited for Berman, et al reference was corrected to 2009.

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### Abbreviations

AA	amino acid
ADF	acid detergent fiber
AOCS	American Oil Chemists Society
DW or dw	dry weight
EPSPS	5-enolpyruvylshikimate-3-phosphate synthase
FA	fatty acid
FAME	fatty acid methyl ester
FW or fw	fresh weight
GLP	good laboratory practice
H.U.	hemagglutinating unit
ILSI	International Life Sciences Institute
LOQ	limit of quantitation
NDF	neutral detergent fiber
PCR	polymerase chain reaction
PRESS	predicted residual sums of squares
QAU	quality assurance unit
RBD	refined, bleached, and deodorized
SOP	standard operating procedure
TD	toasted and defatted
TIU	trypsin inhibitor unit

## 1.0 Summary

Monsanto Company has developed biotechnology-derived soybean, MON 87705, to generate nutritionally-improved soybean oil with decreased levels of saturated fats (16:0 palmitic acid and 18:0 stearic acid) and increased levels of oleic acid (18:1) through suppression of FAD2 and FATB, two key enzymes in the fatty acid biosynthetic pathway. Suppression of these enzymes has been demonstrated to decrease saturated fatty acids and increase oleic acid in the resulting oil (Lightner, J. *et al.*, 2002; Hitz, W. 1999). This oil has enhanced stability, an improved nutritional profile and better food functionality. In addition, MON 87705 contains the 5-enolpyruvylshikimate-3-phosphate protein from *Agrobacterium* sp. strain CP4 (CP4 EPSPS) that confers glyphosate tolerance to Roundup<sup>®1</sup> herbicide. MON 87705 soybean is considered to be compositionally equivalent to conventional soybean except for the intended fatty acid changes and a slight increase in the level of one minor fatty acid.

The purpose of this study was to evaluate the composition of MON 87705 (test substance) compared to a conventional control (A3525) that has a genetic background similar to the test substance, but does not express the decreased saturate trait, the increased oleic trait or the herbicide tolerance trait. In this study, composition analyses of the test and control substances were conducted on mature seed collected from two United States (US) field trials during 2007 under Production Plans 07-01-83-18 and 07-01-83-19, and on the toasted, defatted (TD) meal, refined, bleached and deodorized (RBD) oil, protein isolate, and crude lecithin processed from the seed. The test and control substances were grown in replicated plots at each of two US sites [Clinton County, Illinois (IL); Jefferson County, Iowa (IA)]. Seed was analyzed for proximates (ash, fat, moisture and protein), acid detergent fiber, neutral detergent fiber, amino acids, fatty acids (C8-24), trypsin inhibitors, phytic acid, lectins, isoflavones, vitamin E ( $\alpha$ -tocopherol), raffinose and stachyose, and carbohydrates by calculation. TD meal was analyzed for proximates (ash, fat, moisture and protein), acid detergent fiber, neutral detergent fiber, amino acids, phytic acid, and trypsin inhibitors, and carbohydrates by calculation. RBD oil was analyzed for fatty acids (C8 – C24) and vitamin E ( $\alpha$ -tocopherol). Protein isolate was analyzed for amino acids and moisture. Lecithin was analyzed for phosphatides (phosphatidic acid, phosphatidylcholine, phosphatidylethanolamine, and phosphatidylinositol). All analyses were conducted in duplicate, and values for each sample were averaged prior to statistical evaluation.

The overall dataset was evaluated for evidence of biologically relevant changes. A total of 72 components were analyzed in the seed, 27 in the meal, 39 in the oil, 19 in the protein isolate, and four in the lecithin. Statistical analyses were conducted using a mixed model analysis of variance with data from a combination of all sites. A total of 111 comparisons were made (161 minus 50 components for which >50% of the observations were below the LOQ) between MON 87705 and the control. No consistent trends, other than the intended

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<sup>1</sup> ®Roundup is a registered trademark of Monsanto Technology, LLC.

changes in fatty acid levels and a slight increase in one minor fatty acid, were observed across all sites. Each test value that had a significant difference from the control was compared to the 99% tolerance interval generated from the reference substances (Berman et al., 2009) and/or to the range of literature values for conventional soybean. Component values that fell within the tolerance interval or range of literature values were considered representative of the natural compositional variability in commercially grown soybean, and the difference was not considered biologically relevant from a food and feed safety or nutritional perspective.

Statistical results of the compositional analyses showed the mean values for 80 of 111 components (72.07%) analyzed in the seed and processed fractions of MON 87705 soybean were not significantly different ( $p \geq 0.05$ ) from the control. Additionally, no statistically significant differences were observed in the protein isolate or lecithin fractions. Of the 31 components found to be significantly different (12 in seed, six in meal, and 13 in oil), 22 were within the 99% tolerance intervals of the conventional reference substances or within literature ranges for conventional soybean and were not considered biologically relevant from a food and feed safety or nutrition perspective. The remaining significant differences observed between MON 87705 and the control were all intended changes in fatty acids in the seed or RBD oil, with the exception of three minor fatty acids observed in oil. In the seed, four intended significant differences ( $p < 0.05$ ) were observed between the test and control substances for the following fatty acids: 16:0 palmitic, 18:0 stearic, 18:1 oleic, and 18:2 linoleic. The mean value for 18:0 stearic acid in seed, although intentionally changed, also fell within the 99% tolerance interval. In the oil, significant differences as a result of intended changes were observed for 16:0 palmitic acid, 18:1 oleic acid, and 18:2 linoleic acid, all of which did not fall within the 99% tolerance interval. The other significant differences in 17:1 9c heptadecenoic acid, 18:2 6c,9c octadecadienoic acid, and other 18:2 trans fatty acids also did not fall within the 99% tolerance interval, but these are only minor fatty acids and do not substantially contribute to overall fatty acid levels. Additionally, a significant difference was observed between test and control in oil for 18:0 stearic acid. This difference was intended, but the value was within the 99% tolerance interval. A slight increase in 17:1 9c heptadecenoic acid in oil from MON 87705 was observed, and has been previously documented (Delaney, et al., 2008; Voelker, et al., 2007), but has no related food and feed safety or nutritional concerns. The slight increase in the level of 18:2 6c,9c octadecadienoic and other 18:2 trans fatty acid observed in both test and control oil were not observed in the seed. Therefore, these increases can be attributed to the industrial processing of the seed to RBD oil, and it is concluded that no meaningful nutritional or safety-related differences were observed in the oil. Based on these results, it is concluded that, except for intended changes and a slight increase, when considered as a percent of total FAs, in the level of one minor fatty acid, MON 87705 soybean is considered to be compositionally equivalent to conventional soybean.

## 2.0 Introduction

Monsanto Company has developed biotechnology-derived soybean, MON 87705, to generate nutritionally-improved soybean oil with decreased levels of saturated fats (16:0 palmitic acid and 18:0 stearic acid) and increased levels of oleic acid (18:1) through suppression of FAD2 and FATB, two key enzymes in the fatty acid biosynthetic pathway. Suppression of these enzymes has been demonstrated to decrease saturated fatty acids and increase oleic acid in the resulting oil (Lightner, J. *et al.*, 2002; Hitz, W. *et al.*, 1999). This oil has enhanced stability, an improved nutritional profile and better food functionality. In addition, MON 87705 contains CP4 EPSPS and has glyphosate tolerance to Roundup herbicide.

## 3.0 Purpose

The purpose of this study was to evaluate the composition of MON 87705 (test substance) compared to a conventional control (A3525) that has a genetic background similar to the test substance, but does not express the decreased saturate, increased oleic trait or the herbicide tolerance trait. In this study, composition analyses of the test and control substances were conducted on mature seed collected from two United States (US) field trials during 2007 under Production Plans 07-01-83-18 and 07-01-83-19, and on the toasted, defatted (TD) meal, refined, bleached and deodorized (RBD) oil, protein isolate, and crude lecithin processed from the seed.

## 4.0 Test, Control, and Reference Substances

### 4.1 Test Substance

The test substance is MON 87705. Two seed lots were used in this study. The mature seed and processed fractions (TD meal, RBD oil, protein isolate, and crude lecithin) were analyzed.

Description	Seed Lot No.	Production
MON 87705	GLP-0704-18516-S	07-01-83-19
MON 87705	GLP-0705-18715-S	07-01-83-18

### 4.2 Control Substance

The control substance is a conventional soybean (A3525) with a genetic background similar to that of the test substance. Two seed lots were used in this study. The harvested seed and processed fractions (TD meal, RBD oil, protein isolate and crude lecithin) were analyzed.

Description	Seed Lot No.	Production
A3525	GLP-0704-18512-S	07-01-83-19
A3525	GLP-0705-18716-S	07-01-83-18

#### **4.3 Reference Substance**

There were no reference substances in this study. Commercial conventional references substances grown in 2007 at three US field sites, and processed and analyzed under a separate study (Berman et al., 2009) were used in this study to determine a 99% tolerance interval for each component analyzed in the test and control substances.

#### **4.4 Collection and Handling of Test and Control Substances**

Seed of the test and control substances were collected from plots at two sites across the United States during the 2007 growing season under the terms of Production Plans 07-01-83-19 (Armstrong, 2008a) and 07-01-83-18 (Armstrong, 2008b). In production 07-01-83-19 seed was planted in duplicate using a randomized complete block design. Production 07-01-83-18 was planted without plot duplication. The field sites for both productions were in Clinton County, IL and Jefferson County, IA. All replicates of test and control seed collected from the IL site and one replicate of test and control seed collected from the IA site of production 07-01-83-19 were used in this study. The second replicate of test and control samples from the IA site was obtained from production 07-01-83-18. Seed was shipped at ambient temperature from all production locations to Monsanto Company, St. Louis, MO, USA. A sub-sample for compositional analyses was obtained from each seed sample. The seed sub-samples were ground and stored in a freezer set to maintain -20 °C at Monsanto Company (St. Louis, MO) prior to transfer to Covance Laboratories Inc. (Madison, WI). The ground samples were stored in a freezer set to maintain -20 °C at Covance until their use in this study. The sample labels contained the Monsanto study number, crop type, sample type, production site and plot number, storage conditions, unique sample ID, lot or source number, material name, container type, and contact name. Before the samples were ground, a sub-sample of the original seed sample was retained at Monsanto Company.

A sub-sample of each test and control seed sample was shipped from Monsanto Company (St. Louis, MO) to GLP-Technologies (GLP-T) in Navasota, Texas, for processing into TD meal, RBD oil, protein isolate and crude lecithin under the terms of Processing Plan RPN-08-024 (Colyer, 2008a). A sub-sample for use in compositional analysis was obtained from each processed sample generated at GLP-T, and was shipped on dry ice to Monsanto Company (St. Louis, MO). The sample containers were re-labeled at Monsanto with the following information: Monsanto study number, processing site, sample identifier, lot number, crop type, material name, sample type, container type, contact name, and storage conditions, and then shipped overnight on dry ice to Covance Laboratories Inc. (Madison, WI) for analysis of the components described in Section 5.0 for the processed fractions.

A retain sample of each processed fraction was maintained at Monsanto Company (St. Louis, MO).

#### **4.5 Test and Control Substance Characterization**

The identities of the seed samples were verified by the Study Director prior to their use in the study by confirming the chain-of-custody documentation supplied with the seed samples. Further characterization of the test and control seed was provided at the molecular level by event-specific PCR analysis for the presence or absence of the inserted DNA. All sample identities from the IL site (Production 07-01-83-19) were confirmed by PCR; however, PCR results for test and control samples from the IA site of this production were inconsistent with identifiers on the sample labels. A comprehensive analysis consisting of single seed purity testing and pooled sample testing for adventitious presence of inserted DNA was conducted on seed samples from this site to confirm the seed identity. One test and one control sample from the IA site contained unacceptable levels of unintended traits, and were excluded from analyses. One test and one control sample from Production 07-01-83-18 were used in this study to provide the second replicate sample of test and control material from the IA site. The identities of the samples from Production 07-01-83-18 were confirmed by event specific PCR analysis of the seed.

#### **5.0 Analytical Methods**

A total of 161 components from the 40 test and control seed and processed fraction samples were analyzed in duplicate by Covance Laboratories Inc. Compositional analyses of seed included the following 72 components: proximates (ash, fat, moisture and protein), acid detergent fiber, neutral detergent fiber, amino acids, fatty acids (C8-24), trypsin inhibitors, phytic acid, lectins, isoflavones, vitamin E ( $\alpha$ -tocopherol), raffinose and stachyose. The carbohydrate content was determined by calculation. TD meal was analyzed for 27 components including proximates (ash, fat, moisture and protein), acid detergent fiber, neutral detergent fiber, amino acids, phytic acid, and trypsin inhibitors. The carbohydrate content was determined by calculation. RBD oil was analyzed for 39 components including fatty acids (C8 – C24) and vitamin E ( $\alpha$ -tocopherol). Protein isolate was analyzed for 14 components including amino acids and moisture. Lecithin was analyzed for four components including phosphatides (phosphatidic acid, phosphatidylcholine, phosphatidylethanolamine, and phosphatidylinositol).

The analytical data generated by Covance Laboratories Inc., including a summary of the methods used, Covance SOP or method mnemonics, literature references, limits of quantitation, and the reference standards used, can be found in the analytical sub-report (Covance study number 6103-749) in Appendix 1 of this report. The Study Director approved all methods utilized in this study.

## 6.0 Control of Bias

To control and/or minimize bias, the seed samples were ground thoroughly before use, and the processed fractions were blended thoroughly before use. The samples were analyzed in the order specified by a computer-generated randomized sample list with the exception of the fatty acid analysis of the seed, which was conducted in the order the samples were received. The Study Director generated the random list and forwarded it to Covance prior to sample analysis.

## 7.0 Statistical Analysis

### 7.1 Data Processing

After compositional analyses were performed at Covance Laboratories Inc., data spreadsheets containing duplicate values for each analysis were transferred to the Monsanto Statistics Center, St. Louis, Missouri. Prior to analyte re-expression, all composition data was averaged across duplicates for each sample. Using SAS<sup>®</sup> programming (SAS, 2002-2003), each average sample value was converted from fresh weight to dry weight based on the samples' measured moisture content, with the exception of moisture and lectin, which were statistically analyzed on a fresh weight basis. Analyte values for RBD oil and lecithin were not converted to dry weight because the industry standard for processing of these fractions generates a moisture-free (<0.1%) material (Sipos and Szuhaj, 1996). 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, Raffinose, Stachyose	% FW	% DW	$X/d$
Fatty Acids	% FW	% Total	$(100)X_j/\Sigma X$
Isoflavones	$\mu\text{g/g FW}$	$\mu\text{g/g DW}$	$X/d$
Trypsin Inhibitor	TIU/mg FW	TIU/mg DW	$X/d$
Seed Vitamin E	mg/100g FW	mg/100g DW	$X/d$
Amino Acids (AA)	mg/g FW	% DW	$X/(10d)$
*'X' is an individual sample value; 'd' is the fraction of the sample that is dry matter. 'X <sub>j</sub> ' is an individual fatty acid value from a sample and 'ΣX' is the sum of all fatty acids from the sample.			

Across samples, analytes with greater than fifty percent of observations below the assay's level of quantitation (LOQ) were excluded from summaries and analysis. Twenty-one fatty acids were excluded in the RBD oil fraction, and 29 fatty acids were excluded in the seed fractions. Excluded analytes are presented in Listing 1 of the Statistical sub-report



(Appendix 2). Otherwise, results below the LOQ were assigned a value equal to half the level of quantitation. The following analytes were assigned a value:

Observations Below LOQ						
Analyte	Units	# Assigned	Total # Analyte Values	% Assigned Values	LOQ	Value Assigned
<b>Seed Fatty Acid</b>						
24:0 Lignoceric	%FW	8	16	50.0	0.02	0.010
<b>Meal Antinutrient</b>						
Trypsin Inhibitor	TIU/mg FW	5	16	31.3	1.00	0.50
<b>RBD Oil Fatty Acid</b>						
14:0 Myristic	%FW	8	16	50.0	0.06	0.03
17:0 Margaric	%FW	7	16	43.8	0.06	0.03
17:1 9c Heptadecenoic	%FW	8	16	50.0	0.06	0.03
<b>Lecithin Phosphatide</b>						
L- $\alpha$ -Phosphatidic Acid	%FW	4	16	25.0	0.70	0.35
L- $\alpha$ -Phosphatidyl-ethanolamine	%FW	2	16	12.5	1.30	0.65

## 7.2 Statistical Methodology

The SAS<sup>®2</sup> GLM procedure (SAS, 2002-2003) was applied to all test and control data to detect potential outliers in the dataset by screening studentized PRESS residuals. A PRESS residual is the difference between any value and its predicted value from a statistical model that excludes the data point. The studentized version scales these residuals so that the values tend to have a standard normal distribution when outliers are absent. Thus, most values are expected to be between  $\pm 3$ . Extreme data points that are also outside of the  $\pm 6$  studentized PRESS residual range are considered for exclusion, as outliers, from the final analyses. The methionine value from A3525 replicate 2 at the IL site and the lectin value from A3525 replicate 1 at the IL site were identified as outliers with PRESS residual values of -6.9899 and 6.0055, respectively. Given the small sample size of this study, it was decided that there was insufficient evidence to remove these values as outliers.

Statistical analyses were conducted on all components across all sites using a mixed model analysis of variance. The combined site analyses used model (1).

<sup>2</sup> <sup>®</sup>SAS is a registered trademark of the SAS Institute, Inc.

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

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

SAS 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. For each component, least-square means, standard errors (S.E.), and the range of observed values are presented for each substance. Reference substances produced in 2007 at three US field sites, and processed and analyzed under separate studies (Berman et al., 2009), were used to generate a 99% tolerance interval for each component analyzed in the seed and processed fractions. The tolerance interval was applied to these study results to establish a range of component values that is representative of the natural population of conventional soybean. The results of the statistical analyses were summarized by Certus International, Inc. in a sub-report (Appendix 2, tables 1-6) and were archived with the study files. In addition, the means of the amino acids re-expressed as % total amino acids and % total protein, and the means of the fatty acids re-expressed as % dw and % total fat were calculated. These data are archived with the study file.

## **8.0 Results and Discussion**

The composition of MON 87705 seed and processed fractions derived from MON 87705 seed were compared to the composition of the seed and processed fractions from a conventional control, A3525. A total of 72 components were analyzed in the seed, 27 in meal, 39 in oil, 19 in protein isolates, and four in lecithin. In the seed analyses 29 components had >50% of values below the LOQ and were not included in statistical analyses or summaries. In the oil analyses 21 components had >50% of values below the LOQ and were not included in statistical analyses or summaries.

The overall combined site dataset was evaluated for evidence of biologically relevant changes. No consistent trends other than the intended changes in fatty acid levels and the slight increase in one minor fatty acid were observed across sites. Of the 111 comparisons (the initial 161 analyses minus the 50 for which >50% of the observations were below the LOQ) between MON 87705 and the control, 80 (72.07%) were not statistically significantly different ( $p < 0.05$ ). A summary of the statistically significant differences is presented in Table 1. Each test value that had a significant difference from the control was compared to the 99% tolerance interval generated from the reference substances (Berman et al., 2009) and/or to the range of literature values for conventional soybean presented in Tables 2-6. Component values that fell within the tolerance interval or range of literature values were considered representative of the natural compositional variability in commercially grown soybean, and the difference was not considered biologically relevant from a food and feed safety or nutritional perspective.

### **8.1 Seed Results**

The statistical analyses showed that in the seed of MON 87705 (test), no significant differences ( $p \geq 0.05$ ) were observed between the test and control (A3525) substances for 60 (83.3%) of the 72 components (Table 1). Of the 12 observed statistical differences, seven were recorded for fatty acids and were consistent with expected levels associated with the enhanced nutritional profile of MON 87705 (Voelker, et al., 2007). Thus overall, the levels of saturated fatty acids (16:0 palmitic and 18:0 stearic acids combined) were decreased below 6% of total FAs, 18:1 oleic acid was elevated to levels greater than 70%, and 18:2 linoleic was decreased below 15% (Table 1). Although 18:0 stearic acid was intentionally decreased, and was observed to be significantly different between the test and control, the mean value for stearic acid was within the 99% tolerance interval, and the individual difference was not considered biologically meaningful from a food and feed safety or nutritional perspective. Mean values of the remaining fatty acids where a difference was observed (20:0 arachidic acid, 20:1 eicosenoic acid, and 22:0 behenic acid) fell within the 99% tolerance intervals for the reference substances or within the range of literature values for conventional soybean (Table 2). Significant differences ( $p < 0.05$ ) were also observed for neutral detergent fiber, total fat, stachyose, daidzein, and genistein; however, the test mean values for these components fell within the 99% tolerance intervals for the reference substances or within the range of published values for conventional soybean, and, therefore, represent the natural variability in these components in soybean. Based on these results, the seed from MON 87705 soybean is considered to be compositionally equivalent to seed from conventional soybean and only intended changes have occurred in the fatty acid levels for MON 87705.

### **8.2 Oil Results**

Of the 17 fatty acids quantified, 13 fatty acids in the test oil were significantly different from the control. These differences were consistent with expected levels associated with the enhanced nutritional profile of MON 87705 (Voelker, et al., 2007). Thus overall, the levels of saturated fatty acids in oil (16:0 palmitic and 18:0 stearic acids combined) were decreased below 6% of total FAs, 18:1 oleic acid was elevated to levels greater than 70%, and 18:2 linoleic was decreased to below 15% (Table 1). Although stearic acid (18:0) was intentionally decreased, and was observed to be significantly different between the test and control, the level of stearic acid in the oil fell within the 99% tolerance interval and the individual difference was not regarded as biologically meaningful from a food and feed safety or nutritional perspective. Mean values of the remaining fatty acids where a difference was observed (14:0 myristic acid, 16:1 palmitoleic acid, 17:0 margaric (heptadecanoic) acid, 17:1 9c heptadecenoic acid, 18:2 6c,9c, octadecadienoic acid, and 18:2 trans isomers, 20:0 arachidic, 20:1 eicosenoic and 22:0 behenic acids) fell within the 99% tolerance intervals for the reference substances or within the range of published values for conventional soybean oil (Table 3), with the exception of 17:1 9c heptadecenoic acid, 18:2 6c,9c, octadecadienoic acid, and 18:2 trans

isomers. A small increase in the minor fatty acid 17:1 9c heptadecenoic acid in oil from MON 87705 was observed, and has been previously documented (Delaney, et al., 2008; Voelker, et al.). It is noteworthy that all assigned values (eight of 16) for this component were from the control samples, and the calculated p-value is based on a comparison between assigned values and measured values. Regardless, there are no adverse food and feed safety or nutrition effects associated with higher levels of 17:1 9c heptadecenoic acid, as this minor fatty acid has been documented in many animal and plant food sources (Codex, 2005). The presence of 18:2 trans isomers (excluding linolelaidic) and 18:2 6c,9c, octadecadienoic acid observed in both test and control oil are not observed in seed and are believed to arise from industrial processing to RBD oil; thus differences are not considered biologically relevant from a food and feed safety or nutritional perspective. Therefore, except for intended changes and a slight increase, when considered as a percent of total FAs, in the minor fatty acid 17:1 9c heptadecenoic acid, the oil of MON 87705 is considered to be compositionally equivalent to oil from conventional soybean.

### **8.3 Meal Results**

Statistical analyses of the meal showed that significant differences ( $p < 0.05$ ) were observed between the test and control substances for six of the 27 components (Table 1): alanine, glycine, isoleucine, lysine, valine, and neutral detergent fiber. For each of these components, test mean values fell within the 99% tolerance interval for the reference substances and within the range of published values for conventional soybean, and the differences were not considered biologically relevant from a food and feed safety or nutritional perspective. Based on these results, the meal from MON 87705 soybean is considered to be compositionally equivalent to meal from conventional soybean.

### **8.4 Protein Isolate Results**

There were no statistically significant differences ( $p < 0.05$ ) between MON 87705 and the conventional control, A3525 for components measured in the protein isolate fraction. Based on these results, the protein isolate from MON 87705 soybean is considered to be compositionally equivalent to protein isolate from conventional soybean.

### **8.5 Lecithin Results**

There were no statistically significant differences ( $p < 0.05$ ) between MON 87705 and the conventional control, A3525 for components measured in the lecithin fraction. Based on these results, the lecithin from MON 87705 soybean is considered to be compositionally equivalent to lecithin from conventional soybean.

## **9.0 Conclusions**

Results of the compositional analyses of MON 87705 and control soybean showed that levels of key nutrients and anti-nutrients quantified in seed and processed fractions are

representative of those in conventional soybean, with the exception of intended changes in the levels of fatty acids in seed and RBD oil. It is concluded that except for the intended changes and slight increase in 17:1 9c heptedecenoic acid, MON 87705 soybean are compositionally equivalent to conventional soybean.

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## **11.0 Protocol Amendments/Deviations**

There were two protocol deviations in this study.

The seed samples were not analyzed for fatty acids in the random order specified by the study director. This study contained a small number of samples that were analyzed for fatty acids in one analytical set, which ran over one night. There was minimal chance for assay bias to occur under these circumstances, and the protocol deviation had no negative effect on the quality of the data generated.

The statistical subreport was not generated at Monsanto, as directed in the protocol, but rather was generated at Certus International, Inc. The protocol incorrectly assigned this responsibility to Monsanto; however, it is typical and appropriate for Certus to generate all statistical subreports in which the analytical data is subjected to an analysis of variance. This deviation has no negative impact on the study.



**Table 1. Summary of Differences (p<0.05) for the Comparison of Soybean Component Levels for Test (MON 87705) vs. the Conventional Control (A3525)**

Component (Units) <sup>1</sup>	MON 87705 Mean	A3525 Mean	Mean Difference (Test minus Control)		Test Range	Commercial Range <sup>2</sup> (99% Tolerance Interval) <sup>3</sup>
			Mean Difference (% of A3525)	Signif. (p-Value)		
<b>Seed Fatty Acid</b>						
16:0 Palmitic (% Total FA)	2.47	11.58	-78.70	<0.001	2.34 - 2.56	9.29 – 11.97 (7.87, 13.81)
18:0 Stearic (% Total FA)	3.26	4.45	-26.75	<0.001	2.95 - 3.51	3.61 – 5.02 (1.86, 6.49)
18:1 Oleic (% Total FA)	73.05	23.45	211.46	<0.001	71.09 - 74.62	21.53 – 31.25 (12.24, 37.84)
18:2 Linoleic (% Total FA)	13.51	52.33	-74.19	<0.001	11.39 - 15.93	47.87 – 53.90 (42.42, 61.15)
20:0 Arachidic (% Total FA)	0.28	0.34	-18.41	0.001	0.26 - 0.31	0.28 – 0.43 (0.13, 0.58)
20:1 11c Eicosenoic (% Total FA)	0.32	0.19	72.19	<0.001	0.29 - 0.37	0.17 – 0.24 (0.12, 0.28)
22:0 Behenic (% Total FA)	0.30	0.33	-7.84	0.042	0.29 - 0.34	0.29 – 0.49 (0.11, 0.69)
<b>Seed Fiber</b>						
Neutral Detergent Fiber (% DW)	16.80	18.51	-9.26	0.016	16.17 - 17.80	12.19 – 17.19 (8.05, 20.51)
<b>Seed Proximate</b>						
Total Fat (% DW)	16.80	17.32	-3.01	0.036	15.74 - 18.40	17.98 – 21.07 (14.61, 24.14)
<b>Seed Antinutrient</b>						
Stachyose (% DW)	3.71	3.43	8.28	0.038	3.55 - 3.99	3.34 – 4.22 (2.64, 4.83)
<b>Seed Isoflavone</b>						
Daidzein (µg/g DW)	1156.66	939.81	23.07	0.008	601.88 - 1517.55	120.17 – 1338.40 (0, 2561.93)
Genistein (µg/g DW)	760.48	642.91	18.29	<0.001	485.09 - 929.09	134.80 – 1221.85 (0, 2278.87)

**Table 1. Summary of Differences (p<0.05) for the Comparison of Soybean Component Levels for Test (MON 87705) vs. the Conventional Control (A3525)**

Component (Units) <sup>1</sup>	MON 87705 Mean	A3525 Mean	Mean Difference (Test minus Control)		Test Range	Commercial Range <sup>2</sup> (99% Tolerance Interval) <sup>2,3</sup>
			Mean Difference (% of A3525)	Signif. (p-Value)		
<b>Meal Amino Acid</b>						
Alanine (% DW)	2.26	2.33	-3.06	0.019	2.22 - 2.29	2.18 – 2.49 (1.87, 2.74)
Glycine (% DW)	2.28	2.34	-2.44	0.023	2.26 - 2.33	2.19 – 2.46 (1.91, 2.68)
Isoleucine (% DW)	2.45	2.53	-3.17	0.006	2.40 - 2.51	2.36 – 2.71 (2.03, 3.06)
Lysine (% DW)	3.25	3.34	-2.49	0.030	3.22 - 3.29	3.07 – 3.48 (2.65, 3.85)
Valine (% DW)	2.55	2.64	-3.47	0.003	2.51 - 2.60	2.48 – 2.91 (2.07, 3.26)
<b>Meal Fiber</b>						
Neutral Detergent Fiber (% DW)	8.55	6.81	25.47	0.016	8.05 - 8.96	6.20 – 10.58 (2.19, 13.59)
<b>RBD Oil Fatty Acid</b>						
14:0 Myristic (% Total FA)	0.031	0.090	-65.15	<0.001	0.031 - 0.032	0.066 – 0.11 (0.024, 0.14)
16:0 Palmitic (% Total FA)	2.49	11.59	-78.50	<0.001	2.36 - 2.69	9.22 – 11.96 (7.75, 13.82)
16:1 Palmitoleic (% Total FA)	0.13	0.11	22.10	0.012	0.12 - 0.14	0.072 – 0.11 (0.044, 0.14)
17:0 Margaric [Heptadecanoic] (% Total FA)	0.036	0.10	-65.27	0.002	0.031 - 0.048	0.047 – 0.10 (0.0082, 0.16)
17:1 9c Heptadecenoic (% Total FA)	0.12	0.031	279.62	0.006	0.092 - 0.14	0 < 0.06 not calculated
18:0 Stearic (% Total FA)	3.22	4.47	-28.05	<0.001	3.00 - 3.40	3.58 – 5.00 (1.83, 6.48)

**Table 1. Summary of Differences (p<0.05) for the Comparison of Soybean Component Levels for Test (MON 87705) vs. the Conventional Control (A3525) (cont.)**

Component (Units) <sup>1</sup>	MON 87705 Mean	A3525 Mean	Mean Difference (Test minus Control)		Test Range	Commercial Range <sup>2</sup> (99% Tolerance Interval) <sup>2,3</sup>
			Mean Difference (% of A3525)	Signif. (p-Value)		
<b>RBD Oil Fatty Acid</b>						
18:1 Oleic (% Total FA)	71.51	23.16	208.71	<0.001	69.30 - 73.01	21.10 – 31.19 (11.72, 37.78)
18:2 6c,9c Octadecadienoic (% Total FA)	0.20	0.65	-69.86	<0.001	0.16 - 0.24	0.031 – 0.074 (0, 0.13)
18:2 Linoleic (% Total FA)	14.41	51.08	-71.78	<0.001	12.25 - 17.39	47.74 – 53.88 (42.34, 61.19)
18:2 Other Trans (% Total FA)	0.18	0.63	-70.92	<0.001	0.14 - 0.23	0 < 0.06 Not calculated
20:0 Arachidic (% Total FA)	0.29	0.36	-19.97	0.001	0.27 - 0.31	0.28 – 0.43 (0.13, 0.59)
20:1 11c Eicosenoic (% Total FA)	0.33	0.19	73.17	<0.001	0.29 - 0.37	0.18 – 0.27 (0.066, 0.37)
22:0 Behenic (% Total FA)	0.31	0.35	-9.74	0.001	0.30 - 0.35	0.30 – 0.50 (0.11, 0.70)

<sup>1</sup> DW = dry weight; FA = fatty acid.

<sup>2</sup> Berman, et al, 2009.

<sup>3</sup> With 95% confidence, interval contains 99% of the values expressed in the population of commercial varieties. Negative limits were set to zero.

**Table 2. Literature Ranges for Components in Soybean Seed**

<b>Tissue Component</b>	<b>Literature Range<sup>1</sup></b>	<b>ILSI Range<sup>2</sup></b>
<b>Proximates</b>	<b>(%dw)</b>	<b>(%dw)</b>
Ash	4.61-5.94 <sup>a</sup> ; 4.29-5.88 <sup>b</sup>	3.885-6.994
Carbohydrates	29.3-41.3 <sup>b</sup>	29.6-50.2
Fat, total (dw)	15.5 – 24.7 <sup>c</sup>	8.104-23.562
Moisture (% fw)	5.3-8.73 <sup>b</sup> , 5.18-14.3 <sup>a</sup>	4.7-34.4
Protein (dw)	329-436 <sup>d</sup> (g/kg); 360-484 <sup>e</sup> (g/kg)	33.19-45.48
<b>Fiber</b>	<b>(%dw)</b>	<b>(%dw)</b>
Acid detergent fiber (ADF)	9 -11.1 <sup>c</sup>	7.81-18.61
Neutral detergent fiber (NDF)	10 – 14.9 <sup>c</sup>	8.53-21.25
<b>Amino Acids</b>	<b>(%dw)<sup>b</sup></b>	<b>(%dw)</b>
Alanine	1.60– 1.86	1.513-2.104
Arginine	2.56 – 3.46	2.285-3.400
Aspartic acid	4.18 – 4.99	3.808-5.122
Cystine/Cysteine	0.54 – 0.66	0.370-0.808
Glutamic acid	6.64 – 8.16	5.843-8.201
Glycine	1.60 - 1.87	1.458-1.997
Histidine	0.98 – 1.16	0.878-1.175
Isoleucine	1.65 – 1.95	1.539-2.077
Leucine	2.81 – 3.37	2.590-3.622
Lysine	2.47 – 2.84	2.285-2.839
Methionine	0.51 – 0.59	0.431-0.681
Phenylalanine	1.78 – 2.19	1.632-2.346
Proline	1.86 – 2.23	1.687-2.284
Serine	1.96 – 2.28	1.106-2.484
Threonine	1.51 – 1.73	1.139-1.862
Tryptophan	0.56 – 0.63	0.3563-0.5016
Tyrosine	1.35 – 1.59	1.016-1.613
Valine	1.71 – 2.02	1.597-2.204
<b>Fatty Acids</b>	<b>(% dw)</b>	<b>(% total)</b>
12:0 Lauric	not available	0.082-0.132
14:0 Myristic	not available	0.071-0.238
16:0 Palmitic	1.44-2.31 <sup>c</sup>	9.55-15.77
16:1 Palmitoleic	not available	0.086-0.194
17:0 Margaric [Heptadecanoic]	not available	0.085-0.146

**Table 2. Literature Ranges for Components in Soybean Seed (continued)**

<b>Tissue Component</b>	<b>Literature Range<sup>1</sup></b>	<b>ILSI Range<sup>2</sup></b>
<b>Fatty Acids</b>	<b>(% dw)</b>	<b>(% total)</b>
17:1 c9 Heptadecenoic	not available	0.073-0.087
18:0 Stearic	0.54-0.91 <sup>c</sup>	2.7-5.88
18:1 Oleic	3.15-8.82 <sup>c</sup>	14.3-32.2
18:2 Linoleic	6.48-11.6 <sup>c</sup>	42.3-58.8
18:3 Linolenic	0.72-2.16 <sup>c</sup>	3.00-12.52
20:0 Arachidic	0.04-0.7 <sup>c</sup>	0.163-0.482
20:1 Eicosenoic	not available	0.14-0.35
20:2 Eicosadienoic	not available	0.077-0.245
22:0 Behenic	not available	0.277-0.595
<b>Vitamins</b>	<b>(mg/100g dw)</b>	<b>(mg/100g dw)</b>
Vitamin E	not available	0.19-6.17
<b>Anti-Nutrients</b>		
Lectin (H.U./mg fw)	0.8-2.4 <sup>b</sup>	0.090-8.460
Trypsin Inhibitor (TIU/mg dw)	33.2-54.5 <sup>b</sup>	19.59-118.68
Phytic Acid (% dw)	not available	0.634-1.960
<b>Isoflavones</b>	<b>(mg/kg dw)</b>	<b>(mg/kg dw)</b>
Daidzein	330.6-706 <sup>b</sup>	60.0-2453.5
Genistein	416.1-1000 <sup>b</sup>	144.3-2837.2
Glycitein	not available	15.3-310.4
<b>Bio-Actives</b>	<b>(%dw)</b>	<b>(%dw)</b>
Raffinose	not available	0.212-0.661
Stachyose	not available	1.21-3.50

<sup>1</sup>Literature range references: <sup>a</sup>Taylor et al., 1999. <sup>b</sup>Padgett et al., 1996. <sup>c</sup>OECD, 2001.

<sup>d</sup>Maestri et al., 1998. <sup>e</sup>Hartwig and Kilen, 1991.

<sup>2</sup>ILSI Crop Composition Database, 2006.

Conversions: mg/100g dw x 10 = mg/kg dw; g/100g dw x 10 = mg/g dw; g/100g dw = % dw; µ/g = mg/kg.

**Table 3. Literature Ranges for Components in Soybean Meal**

<b>Tissue Component</b>	<b>Literature Range<sup>1</sup></b>
<b>Proximates</b>	<b>(% dw)</b>
Ash	5.2 – 9.1 <sup>a</sup>
Carbohydrates	32.0 – 38.0 <sup>b</sup>
Fat, total	0.5 -3.30 <sup>a</sup>
Moisture (% fw)	5.58-11.7 <sup>a</sup>
Protein	47.4 – 59.5 <sup>a</sup>
<b>Fiber</b>	<b>(% dw)<sup>a</sup></b>
Acid detergent fiber (ADF)	5.2 – 6.7
Neutral detergent fiber (NDF)	7.4 – 12.2
<b>Amino Acids</b>	<b>(%dw)<sup>a</sup></b>
Alanine	2.18 – 2.59
Arginine	3.29 – 4.49
Aspartic acid	5.18 – 6.83
Cystine/Cysteine	0.6 – 0.92
Glutamic acid	8.05 – 11.21
Glycine	2.02 – 2.40
Histidine	1.32 – 1.63
Isoleucine	2.11 – 2.74
Leucine	3.62 – 4.72
Lysine	2.97 – 3.69
Methionine	0.5 – 0.9
Phenylalanine	2.39 – 3.19
Proline	2.32 – 3.05
Serine	1.97 – 3.3
Threonine	0.80 – 2.24
Tryptophan	0.60 – 2.08
Tyrosine	1.68 – 2.17
Valine	2.29 – 2.92
<b>Anti-Nutrients</b>	
Trypsin Inhibitors (TIU/mg dw)	3.8 – 17.9 <sup>a</sup>
Phytic Acid (% dw)	1.3 – 4.1 <sup>a</sup>

<sup>1</sup>

Literature range references: <sup>a</sup>Lundry, et al., 2008. <sup>b</sup>Padgette et al., 1996.

**Table 4. Literature Ranges for Components in Soybean Oil**

<b>Tissue Component</b>	<b>Literature Range<sup>1</sup></b>
<b>Fatty Acids</b>	
14:0 Myristic	ND – 0.2 <sup>a</sup>
16:0 Palmitic	7 - 12 <sup>b</sup>
16:1 Palmitoleic	≤ 0.2 <sup>b</sup>
17:0 Margaric [Heptadecanoic]	ND – 0.1 <sup>a</sup>
17:1 9c Heptadecenoic	ND – 0.1 <sup>a</sup>
18:0 Stearic	2 – 5 <sup>b</sup>
18:1 Oleic	19 – 34 <sup>b</sup>
18:2 Linoleic	48 – 60 <sup>b</sup>
18:3 Linolenic	2 -10 <sup>b</sup>
20:0 Arachidic	0.1 – 0.6 <sup>a</sup>
20:1 Eicosenoic	ND – 0.5 <sup>a</sup>
20:2 Eicosadienoic	ND – 0.1 <sup>a</sup>
22:0 Behenic	ND – 0.7 <sup>a</sup>
<b>Vitamins</b>	
<b>mg/100g fw</b>	
Vitamin E	0.9 – 35.2 <sup>a</sup>

<sup>1</sup>Literature range references: <sup>a</sup>Codex, 2005 (% total FA). <sup>b</sup>Lundry, et al., 2008 (% fw). ND = not detected.

**Table 5. Literature Ranges for Components in Soybean Protein Isolate**

<b>Tissue Component</b>	<b>Literature Range or Value<sup>1</sup></b>
<b>Proximates</b>	
Moisture (% fw)	3.9 – 7.0
<b>Amino Acids</b>	<b>(%dw)</b>
Alanine	NA
Arginine	6.67
Aspartic acid	NA
Cystine/Cysteine	1.05
Glutamic acid	NA
Glycine	NA
Histidine	2.3
Isoleucine	4.25
Leucine	6.78
Lysine	5.33
Methionine	1.13
Phenylalanine	4.59
Proline	NA
Serine	NA
Threonine	3.14
Tryptophan	1.12
Tyrosine	NA
Valine	4.1

<sup>1</sup>Literature range or value reference: Lundry, et. al., 2008.



**Table 6. Literature Ranges for Components in Soybean Lecithin**

<b>Tissue Component</b>	<b>Literature Range<sup>1</sup></b>
<b>Phosphatides (%fw)</b>	
$\alpha$ -Phosphatidic Acid	0.2 – 14.0
$\alpha$ -Phosphatidylcholine	12.0 – 46.0
$\alpha$ -Phosphatidylethanolamine	8.0 – 34.0
$\alpha$ -Phosphatidylinositol	1.7 – 21.0

---

Literature range reference: <sup>1</sup>Lundry, et al., 2008.

**Appendix 1. Covance Laboratories Inc. Analytical  
Sub-Report**

**Composition Analyses of Soybean Seed, Meal, Oil, Protein Isolate, and Lecithin  
Derived from MON 87705 Produced in the United States during the 2007 Field Season**

The following 58 pages are the analytical sub-report  
Pages 35 — 92



# Final Sub-Report

Study Title	Composition Analyses of Soybean Seed, Meal, Oil, Protein Isolate, and Lecithin Derived from MON 87705 Produced in the United States during the 2007 Field Season
Sponsor	Monsanto Company Biotechnology Regulatory Affairs 800 North Lindbergh Blvd. St. Louis, MO 63167
Study Director	Denise R. Lundry Monsanto Company
Compositional Analysis Testing Facility	Covance Laboratories Inc. 3301 Kinsman Blvd. Madison, WI 53704
Covance Principal Investigator	Kathleen D. Miller
Monsanto Study Number	REG-08-144
Covance Study Number	6103-749
Sub-Report Issued	03 November, 2008
Page Number	1 of 58

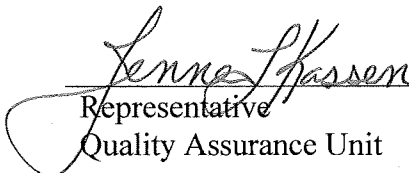
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### QUALITY ASSURANCE STATEMENT

This report has been reviewed by the Quality Assurance Unit of Covance Laboratories Inc. and accurately reflects the raw data. The following study specific inspections were conducted and findings reported to the principal investigator (PI), study director (SD), and associated management.

Inspection Dates		Phase	Date Reported to PI and PI Management	Date Reported to SD and SD Management
From	To			
29 May 2008	29 May 2008	Data/Table Review	29 May 2008	25 Sep 2008
08 Aug 2008	08 Aug 2008	Analytical Chemistry	08 Aug 2008	25 Sep 2008
24 Sep 2008	25 Sep 2008	Draft Report and Data Review	25 Sep 2008	03 Nov 2008
14 Oct 2008	14 Oct 2008	Revised Draft Report Review	14 Oct 2008	03 Nov 2008

  
\_\_\_\_\_  
Representative  
Quality Assurance Unit

3 Nov 08  
\_\_\_\_\_  
Date

**SIGNATURE**

Kathleen D. Miller  
Kathleen D. Miller  
Principal Investigator  
Food and Drug Analysis  
Covance Laboratories Inc.

03 Nov 08  
Date

## STUDY IDENTIFICATION

**Monsanto Study Number:**  
REG-08-144

**Sponsor:**  
Monsanto Company  
Biotechnology Regulatory Affairs  
800 North Lindbergh Blvd.  
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<b>Study Timetable</b>	
Study Initiation Date:	18 April, 2008
Study Completion Date:	03 November, 2008

## COVANCE KEY PERSONNEL

### Food and Drug Analysis

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Vice President and General Manager

Erin A. Meinholz  
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Douglas J. Winters  
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Supervisor **Proximate Chemistry and  
Special Projects**

Robin M. Huggins  
Supervisor **Sample Preparation**

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Supervisor **Food Packaging and  
Food Safety**

John W. Austad  
Supervisor **Technical Development**

Dustin M. LaRue  
Supervisor **Third Shift**

Ryan P. Ellefson  
Supervisor **Monograph**

### Quality Assurance Unit

Timothy H. Valley  
Manager



## INTRODUCTION

The purpose of this portion of the study was to generate data for compositional analyses of seed and processed fractions collected from MON 87705 and a control substance. Processed fractions included mature seed, toasted, defatted (TD) meal, refined, bleached and deodorized (RBD) oil, protein isolates, and crude lecithin processed from seed.

## REGULATORY COMPLIANCE

This portion of the study was conducted in accordance with the Environmental Protection Agency (EPA) Good Laboratory Practice Standards, §160.135(b) in compliance with all requirements of section 40 CFR 160 with the following exceptions:

1. Reference standards (if applicable) were not listed in the protocol but are listed in the sub-report, were not characterized according to GLP standards, and no reserve samples were retained from each batch.
2. Storage stability was not determined in this portion of the study; however, the samples were maintained at Covance at approximately  $-20^{\circ}\text{C}$  throughout the study to minimize degradation.

These exceptions had no effect on the integrity or quality of the study.

## MAJOR COMPUTER SYSTEMS

The major computer systems used on this study may have included, but were not limited to, the following systems:

- Balance Application (balance weight capture system)
- eNotes (official study communication)
- Waters Empower<sup>®</sup> Chromatography Manager (data acquisition and result calculation system)
- Laboratory Information Management System (sample and assay tracking)
- Metasys or REES (monitor and document storage conditions for test/control/reference materials and samples, if applicable)
- UV-Visible ChemStation (data acquisition)

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<sup>®</sup>Empower is a registered trademark of Waters Corporation.

## TEST, CONTROL, AND REFERENCE SUBSTANCES

### Test Substance

The test substance was MON 87705. The mature seed and processed fractions were evaluated in this portion of the study. The test substance was identified as follows:

Description	Starting Seed Lot No.
MON 87705	GLP-0704-18516-S
MON 87705	GLP-0705-18715-S

### Control Substance

The control substance was a conventional soybean material A3525. The harvested seed and processed fractions were evaluated in this portion of the study. The control substance was identified as follows:

Description	Starting Seed Lot No.
A3525	GLP-0704-18512-S
A3525	GLP-0705-18716-S

### Reference Substances

There were no reference substances analyzed in this portion of the study.

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

### Characterization of Test and Control Substances

Information on the characterization that defined the test and control seed was the responsibility of the Sponsor.

### Storage Retention

Upon receipt the samples were stored in a freezer set to maintain  $-20 \pm 10^{\circ}\text{C}$ . Reference standards were stored according to vendor specifications.

### Disposition

Any remaining prepared dilutions or extractions of the samples (if applicable) will be discarded at Covance. After the samples are analyzed, all excess samples will be retained until notified of final disposition by the Sponsor.

Remaining reference standards may be used for other testing.

### Retain Samples

Retain samples of the seed were the responsibility of the Sponsor.

### **SAFETY PRECAUTIONS**

Safety precautions were taken as outlined in the Environmental, Health, and Safety section of the Covance Policies and Procedures Manual.

### **SAMPLE RECEIPT AND HANDLING**

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

### **CONTROL OF BIAS**

The samples were analyzed in a non-systematic, random order to minimize assay bias. The samples were entered into the LIMS system in a random order provided by the Sponsor.

### **EXPERIMENTAL DESIGN**

This study used approved analytical methods to determine the composition of the samples. See Appendix A for a summary of the analytical methods referenced by the method mnemonic. See Appendix B for fatty acid nomenclature.

The following analyses were performed on **Seed** samples:

<b>Analyte</b>	<b>Method Mnemonic<sup>1</sup></b>
Proximates	
Moisture	M100
Protein	PGEN
Fat	FSOX
Ash	ASHM
Acid detergent fiber	ADF
Neutral detergent fiber	NDFE
Amino acid composition	TAA5
Fatty acid profile (C8-C24)	FALT
Trypsin Inhibitors	TRIP
Phytic acid	PHYT
Lectins	LECT
Isoflavones	ISOF
Vitamin E (alpha-tocopherol)	LCAT
Stachyose	SUGT
Raffinose	SUGT

<sup>1</sup>Analytical methods were kept on file at Covance Laboratories Inc.

Carbohydrate (CHO) values were estimated by calculation.

The following analyses were performed on **TD Meal** samples:

<b>Analyte</b>	<b>Method Mnemonic<sup>1</sup></b>
Proximates	
Moisture	M100
Protein	PGEN
Fat	FSOX
Ash	ASHM
Acid detergent fiber	ADF
Neutral detergent fiber	NDFE
Amino Acids	TAA5
Phytic acid	PHYT
Trypsin Inhibitor	TRIP

<sup>1</sup>Analytical methods were kept on file at Covance Laboratories Inc.

Carbohydrate (CHO) values were estimated by calculation.

The following analyses were performed on **RBD Oil** samples:

<b>Analyte</b>	<b>Method Mnemonic<sup>1</sup></b>
Fatty Acid Profile (C8-C24)	FALT
Vitamin E (alpha-tocopherol)	LCAT

<sup>1</sup>Analytical methods were kept on file at Covance Laboratories Inc.

The following analyses were performed on **Protein Isolate** samples:

<b>Analyte</b>	<b>Method Mnemonic<sup>1</sup></b>
Amino Acids	TAA5
Moisture	M100

<sup>1</sup>Analytical methods are kept on file at Covance Laboratories Inc.

The following analysis was performed on **Crude Lecithin** samples:

<b>Analyte</b>	<b>Method Mnemonic<sup>1</sup></b>
Phosphatides	LPLC

<sup>1</sup>Analytical methods are kept on file at Covance Laboratories Inc.

The samples were analyzed in duplicate unless otherwise determined by Covance methods and/or SOPs. A minimum frequency of 10% quality control samples (duplicates, recoveries, certified reference standards, blanks, or validated control samples) were prepared and analyzed at Covance. Appropriate standards were used in each assay as reference standards for the analytical procedures or calibration of equipment. Re-analyses were performed as determined by Covance methods and/or SOPs. When re-analyses were deemed necessary, documentation and justification were provided in the raw data.

## STATISTICAL EVALUATIONS

There were no statistical evaluations performed on the final tabulated results by Covance.

## RECORD RETENTION

All data relating to or generated by this portion of the project, including (if applicable) a copy of the protocol and amendments, a copy of the analytical sub-report, results, laboratory notebooks and any other information or records relating to the project will be retained in the archives of Covance in accordance with EPA 40 CFR Part 160. The data will be returned to Monsanto Company, upon request by the Sponsor. Electronic data collected at Covance Laboratories Inc. using Empower<sup>®</sup> software will be stored on duplicate compact discs (CDs). One of the CDs will be stored in the archives at Covance

Laboratories Inc. The second CD will be transferred to the archives at Monsanto Company in St. Louis, Missouri.

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

1. Instrument calibration and maintenance records
2. Storage temperature records
3. Training records of study personnel
4. Durable media records
5. Standard Operating Procedures
6. Standard logbooks
7. Certificates of Analysis for assay reference standards

## RESULTS

The duplicate results for seed, meal, oil, protein isolate, and crude lecithin analyses are presented in Tables 1 through 5, respectively. All of the results were on a fresh-weight basis and were deemed acceptable.

## PROTOCOL DEVIATION

Protocol	Actual Procedure
<b>7.0 Control of Bias</b> The samples will be analyzed in a non-systematic, random order to minimize assay bias. Monsanto will provide the random order to Covance Laboratories Inc. and a copy shall be maintained in the study file at Monsanto.	The oil samples were not analyzed for fatty acids (FALT) using the random order to minimize assay bias as directed in the protocol.
This deviation had no effect on the integrity or quality of this portion of the study.	

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

Sample Number	07018319-00010	07018319-00011	07018318-00001
Material Name	A3525	A3525	A3525
Field Site	IL	IL	IA
Replicate	1	2	1
Covance LIMS Number	80408257	80408264	80408261
<b>Proximate (%)</b>			
Moisture	7.45	7.45	7.92
Moisture	7.46	7.87	8.10
Protein	36.8	38.9	37.0
Protein	37.1	38.7	37.4
Total Fat	17.0	16.1	15.2
Total Fat	17.4	16.4	15.1
Ash	4.66	4.93	4.78
Ash	4.73	4.85	4.45
Carbohydrates	34.1	32.6	35.1
Carbohydrates	33.3	32.2	35.0
<b>Acid Detergent Fiber (%)</b>			
Acid Detergent Fiber (%)	17.6	16.0	15.1
Acid Detergent Fiber (%)	16.6	15.8	13.6
Neutral Detergent Fiber (%)	16.3	17.9	17.2
Neutral Detergent Fiber (%)	18.1	17.7	17.0
Phytic Acid (%)	0.895	1.23	1.19
Phytic Acid (%)	0.919	1.23	1.19
Lectin (H.U./mg)*	3.61	0.968	1.78
Lectin (H.U./mg)*	0.890	0.499	0.672
Raffinose (%)	0.635	0.661	0.372
Raffinose (%)	0.624	0.662	0.394
Stachyose (%)	3.18	3.25	3.00
Stachyose (%)	3.23	3.24	3.29
Trypsin Inhibitor (TIU/mg)**	34.4	24.3	19.9
Trypsin Inhibitor (TIU/mg)**	28.7	26.1	22.6
Vitamin E (mg/100g)	4.34	4.72	1.97
Vitamin E (mg/100g)	4.11	4.85	1.93
<b>Isoflavones (µg/g)</b>			
Daidzein	653	404	1290
Daidzein	690	388	1220
Glycitein	55.1	35.1	110
Glycitein	55.4	28.4	90.5
Genistein	538	343	776
Genistein	577	353	736

\* H.U. - Hemagglutinating Unit

\*\*TIU - Trypsin Inhibitor Unit

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

<b>Sample Number</b>	07018319-00010	07018319-00011	07018318-00001
<b>Material Name</b>	A3525	A3525	A3525
<b>Field Site</b>	IL	IL	IA
<b>Replicate</b>	1	2	1
<b>Covance LIMS Number</b>	80408257	80408264	80408261
<b>Amino Acids (mg/g)</b>			
Aspartic Acid	41.4	44.3	42.1
Aspartic Acid	39.8	43.4	41.8
Threonine	13.4	14.4	13.8
Threonine	13.8	13.8	13.7
Serine	18.2	19.5	18.4
Serine	18.1	19.7	18.1
Glutamic Acid	66.1	71.5	67.9
Glutamic Acid	62.7	70.8	67.5
Proline	18.0	19.0	17.8
Proline	17.7	18.4	17.8
Glycine	16.4	17.1	16.4
Glycine	15.6	16.7	16.2
Alanine	16.0	16.8	16.2
Alanine	15.0	16.3	16.1
Cystine	5.46	5.60	5.30
Cystine	5.39	5.69	5.37
Valine	18.4	19.1	18.8
Valine	16.6	18.9	18.7
Methionine	5.07	5.08	5.16
Methionine	4.89	5.18	5.16
Isoleucine	17.5	18.2	17.6
Isoleucine	15.8	18.0	17.5
Leucine	27.9	29.5	28.5
Leucine	26.5	29.3	28.3
Tyrosine	11.8	13.5	12.3
Tyrosine	12.1	12.5	11.8
Phenylalanine	19.0	20.1	19.4
Phenylalanine	17.6	19.9	19.3
Lysine	23.7	24.9	24.2
Lysine	22.6	24.6	24.0
Histidine	9.77	10.6	9.83
Histidine	9.35	10.4	9.76
Arginine	28.1	31.6	29.7
Arginine	27.4	30.4	28.9
Tryptophan	4.23	4.17	4.30
Tryptophan	4.47	4.54	4.32



**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

Sample Number	07018319-00010	07018319-00011	07018318-00001
Material Name	A3525	A3525	A3525
Field Site	IL	IL	IA
Replicate	1	2	1
Covance LIMS Number	80408257	80408264	80408261
<b>Fatty Acids (%)</b>			
8:0 Caprylic	< 0.0200	< 0.0200	< 0.0200
8:0 Caprylic	< 0.0200	< 0.0200	< 0.0200
10:0 Capric	< 0.0200	< 0.0200	< 0.0200
10:0 Capric	< 0.0200	< 0.0200	< 0.0200
12:0 Lauric	< 0.0200	< 0.0200	< 0.0200
12:0 Lauric	< 0.0200	< 0.0200	< 0.0200
14:0 Myristic	< 0.0200	< 0.0200	< 0.0200
14:0 Myristic	< 0.0200	< 0.0200	< 0.0200
14:1 Myristoleic	< 0.0200	< 0.0200	< 0.0200
14:1 Myristoleic	< 0.0200	< 0.0200	< 0.0200
15:0 Pentadecanoic	< 0.0200	< 0.0200	< 0.0200
15:0 Pentadecanoic	< 0.0200	< 0.0200	< 0.0200
15:1 10c Pentadecenoic	< 0.0200	< 0.0200	< 0.0200
15:1 10c Pentadecenoic	< 0.0200	< 0.0200	< 0.0200
16:0 Palmitic	1.92	1.79	1.70
16:0 Palmitic	1.91	1.79	1.70
16:1 9t Palmitelaidic	< 0.0200	< 0.0200	< 0.0200
16:1 9t Palmitelaidic	< 0.0200	< 0.0200	< 0.0200
16:1 9c Palmitoleic	< 0.0200	< 0.0200	< 0.0200
16:1 9c Palmitoleic	< 0.0200	< 0.0200	< 0.0200
17:0 Margaric	< 0.0200	< 0.0200	< 0.0200
17:0 Margaric	< 0.0200	< 0.0200	< 0.0200
17:1 9c Heptadecenoic	< 0.0200	< 0.0200	< 0.0200
17:1 9c Heptadecenoic	< 0.0200	< 0.0200	< 0.0200
18:0 Stearic	0.718	0.711	0.647
18:0 Stearic	0.716	0.709	0.646
18:1 Elaidic	< 0.0200	< 0.0200	< 0.0200
18:1 Elaidic	< 0.0200	< 0.0200	< 0.0200
18:1 Oleic	3.89	4.04	3.16
18:1 Oleic	3.88	4.03	3.16
18:2 Linolelaidic	< 0.0200	< 0.0200	< 0.0200
18:2 Linolelaidic	< 0.0200	< 0.0200	< 0.0200
18:2 Other Trans	< 0.0200	< 0.0200	< 0.0200
18:2 Other Trans	< 0.0200	< 0.0200	< 0.0200
18:2 6c,9c Octadecadienoic	< 0.0200	< 0.0200	< 0.0200
18:2 6c,9c Octadecadienoic	< 0.0200	< 0.0200	< 0.0200
18:2 Linoleic	8.88	8.11	7.74
18:2 Linoleic	8.87	8.07	7.74
18:2 9c,15c Octadecadienoic	< 0.0200	< 0.0200	< 0.0200
18:2 9c,15c Octadecadienoic	< 0.0200	< 0.0200	< 0.0200
20:0 Arachidic	0.0570	0.0577	0.0477
20:0 Arachidic	0.0565	0.0580	0.0474

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

Sample Number	07018319-00010	07018319-00011	07018318-00001
Material Name	A3525	A3525	A3525
Field Site	IL	IL	IA
Replicate	1	2	1
Covance LIMS Number	80408257	80408264	80408261
<b>Fatty Acids (%)</b>			
18:3 Gamma Linolenic	< 0.0200	< 0.0200	< 0.0200
18:3 Gamma Linolenic	< 0.0200	< 0.0200	< 0.0200
18:3 9c,12c,15t Octadecatrienoic	< 0.0200	< 0.0200	< 0.0200
18:3 9c,12c,15t Octadecatrienoic	< 0.0200	< 0.0200	< 0.0200
18:3 Other 18:3 Trans	< 0.0200	< 0.0200	< 0.0200
18:3 Other 18:3 Trans	< 0.0200	< 0.0200	< 0.0200
20:1 Eicosenoic	0.0353	0.0328	0.0253
20:1 Eicosenoic	0.0353	0.0316	0.0247
18:3 Linolenic	1.07	0.947	1.26
18:3 Linolenic	1.07	0.935	1.25
18:4 6c,9c,12c,15t			
Octadecatetraenoic	< 0.0200	< 0.0200	< 0.0200
18:4 6c,9c,12c,15t			
Octadecatetraenoic	< 0.0200	< 0.0200	< 0.0200
18:4 Stearidonic (SDA)	< 0.0200	< 0.0200	< 0.0200
18:4 Stearidonic (SDA)	< 0.0200	< 0.0200	< 0.0200
20:2 11c,14c Eicosadienoic	< 0.0200	< 0.0200	< 0.0200
20:2 11c,14c Eicosadienoic	< 0.0200	< 0.0200	< 0.0200
22:0 Behenic	0.0559	0.0563	0.0467
22:0 Behenic	0.0564	0.0540	0.0452
22:1 Erucic	< 0.0200	< 0.0200	< 0.0200
22:1 Erucic	< 0.0200	< 0.0200	< 0.0200
20:3 11c,14c,17c Eicosatrienoic	< 0.0200	< 0.0200	< 0.0200
20:3 11c,14c,17c Eicosatrienoic	< 0.0200	< 0.0200	< 0.0200
20:4 Arachidonic	< 0.0200	< 0.0200	< 0.0200
20:4 Arachidonic	< 0.0200	< 0.0200	< 0.0200
20:5 5c,8c,11c,14c,17c			
Eicosapentaenoic (EPA)	< 0.0200	< 0.0200	< 0.0200
20:5 5c,8c,11c,14c,17c			
Eicosapentaenoic (EPA)	< 0.0200	< 0.0200	< 0.0200
24:0 Lignoceric	0.0289	0.0294	< 0.0200
24:0 Lignoceric	0.0297	0.0299	< 0.0200
24:1 Nervonic	< 0.0200	< 0.0200	< 0.0200
24:1 Nervonic	< 0.0200	< 0.0200	< 0.0200
22:5 7c,10c,13c,16c,19c			
Docosapentaenoic (DPA)	< 0.0200	< 0.0200	< 0.0200
22:5 7c,10c,13c,16c,19c			
Docosapentaenoic (DPA)	< 0.0200	< 0.0200	< 0.0200

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

<b>Sample Number</b>	07018319-00010	07018319-00011	07018318-00001
<b>Material Name</b>	A3525	A3525	A3525
<b>Field Site</b>	IL	IL	IA
<b>Replicate</b>	1	2	1
<b>Covance LIMS Number</b>	80408257	80408264	80408261
<b>Fatty Acids (%)</b>			
22:6 4c,7c,10c,13c,16c,19c			
Docosahexaenoic (DHA)	< 0.0200	< 0.0200	< 0.0200
22:6 4c,7c,10c,13c,16c,19c			
Docosahexaenoic (DHA)	< 0.0200	< 0.0200	< 0.0200

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

<b>Sample Number</b>	07018319-00007	07018319-00014	07018319-00015
<b>Material Name</b>	A3525	MON 87705	MON 87705
<b>Field Site</b>	IA	IL	IL
<b>Replicate</b>	2	1	2
<b>Covance LIMS Number</b>	80408263	80408262	80408259
<b>Proximate (%)</b>			
Moisture	8.45	7.79	8.00
Moisture	8.56	7.94	7.91
Protein	38.5	36.7	39.9
Protein	38.3	36.5	39.8
Total Fat	15.0	16.8	16.0
Total Fat	15.4	17.1	15.6
Ash	4.59	4.72	4.61
Ash	4.61	4.70	4.52
Carbohydrates	33.5	34.0	31.5
Carbohydrates	33.1	33.8	32.2
Acid Detergent Fiber (%)	15.1	16.6	14.9
Acid Detergent Fiber (%)	14.0	15.2	14.1
Neutral Detergent Fiber (%)	16.2	14.8	16.2
Neutral Detergent Fiber (%)	16.0	15.0	15.1
Phytic Acid (%)	1.23	0.949	1.11
Phytic Acid (%)	1.28	0.942	1.05
Lectin (H.U./mg)*	1.08	1.48	1.21
Lectin (H.U./mg)*	0.657	0.849	0.554
Raffinose (%)	0.351	0.593	0.669
Raffinose (%)	0.357	0.600	0.664
Stachyose (%)	2.98	3.22	3.74
Stachyose (%)	3.07	3.33	3.61
Trypsin Inhibitor (TIU/mg)**	27.3	26.9	26.3
Trypsin Inhibitor (TIU/mg)**	28.4	36.7	29.1
Vitamin E (mg/100g)	1.69	3.60	4.16
Vitamin E (mg/100g)	1.56	3.35	4.34
<b>Isoflavones (µg/g)</b>			
Daidzein	1110	991	532
Daidzein	1160	910	576
Glycitein	77.6	87.0	36.9
Glycitein	88.5	63.8	44.4
Genistein	676	690	437
Genistein	734	658	456

\* H.U. - Hemagglutinating Unit

\*\*TIU - Trypsin Inhibitor Unit

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

<b>Sample Number</b>	07018319-00007	07018319-00014	07018319-00015
<b>Material Name</b>	A3525	MON 87705	MON 87705
<b>Field Site</b>	IA	IL	IL
<b>Replicate</b>	2	1	2
<b>Covance LIMS Number</b>	80408263	80408262	80408259
<b>Amino Acids (mg/g)</b>			
Aspartic Acid	42.7	41.9	44.9
Aspartic Acid	43.4	41.2	45.5
Threonine	14.0	13.8	15.1
Threonine	14.4	14.4	15.2
Serine	19.2	19.0	19.9
Serine	19.3	18.9	20.2
Glutamic Acid	69.3	67.3	71.2
Glutamic Acid	70.6	65.1	72.2
Proline	18.3	17.2	19.4
Proline	18.5	17.5	19.7
Glycine	16.6	16.4	17.0
Glycine	16.6	16.1	17.2
Alanine	16.5	16.3	16.5
Alanine	16.6	15.6	16.7
Cystine	5.39	5.75	5.57
Cystine	5.36	5.68	5.62
Valine	18.7	18.4	18.3
Valine	19.1	17.1	18.6
Methionine	5.23	5.25	5.20
Methionine	5.13	5.16	5.31
Isoleucine	17.6	17.3	17.6
Isoleucine	17.9	16.4	17.7
Leucine	28.9	28.2	29.5
Leucine	29.3	27.4	29.7
Tyrosine	13.2	13.3	13.8
Tyrosine	12.7	13.1	13.7
Phenylalanine	19.7	19.0	20.1
Phenylalanine	19.3	18.6	20.4
Lysine	24.4	24.2	24.8
Lysine	24.7	23.7	25.1
Histidine	10.0	9.96	10.4
Histidine	10.1	9.69	10.6
Arginine	31.4	29.5	32.6
Arginine	31.6	28.7	33.0
Tryptophan	4.28	4.33	4.57
Tryptophan	4.35	4.37	4.56

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

Sample Number	07018319-00007	07018319-00014	07018319-00015
Material Name	A3525	MON 87705	MON 87705
Field Site	IA	IL	IL
Replicate	2	1	2
Covance LIMS Number	80408263	80408262	80408259
<b>Fatty Acids (%)</b>			
8:0 Caprylic	< 0.0200	< 0.0200	< 0.0200
8:0 Caprylic	< 0.0200	< 0.0200	< 0.0200
10:0 Capric	< 0.0200	< 0.0200	< 0.0200
10:0 Capric	< 0.0200	< 0.0200	< 0.0200
12:0 Lauric	< 0.0200	< 0.0200	< 0.0200
12:0 Lauric	< 0.0200	< 0.0200	< 0.0200
14:0 Myristic	< 0.0200	< 0.0200	< 0.0200
14:0 Myristic	< 0.0200	< 0.0200	< 0.0200
14:1 Myristoleic	< 0.0200	< 0.0200	< 0.0200
14:1 Myristoleic	< 0.0200	< 0.0200	< 0.0200
15:0 Pentadecanoic	< 0.0200	< 0.0200	< 0.0200
15:0 Pentadecanoic	< 0.0200	< 0.0200	< 0.0200
15:1 10c Pentadecenoic	< 0.0200	< 0.0200	< 0.0200
15:1 10c Pentadecenoic	< 0.0200	< 0.0200	< 0.0200
16:0 Palmitic	1.73	0.383	0.376
16:0 Palmitic	1.72	0.382	0.369
16:1 9t Palmitelaidic	< 0.0200	< 0.0200	< 0.0200
16:1 9t Palmitelaidic	< 0.0200	< 0.0200	< 0.0200
16:1 9c Palmitoleic	< 0.0200	< 0.0200	0.0209
16:1 9c Palmitoleic	< 0.0200	< 0.0200	0.0210
17:0 Margaric	< 0.0200	< 0.0200	< 0.0200
17:0 Margaric	< 0.0200	< 0.0200	< 0.0200
17:1 9c Heptadecenoic	< 0.0200	< 0.0200	< 0.0200
17:1 9c Heptadecenoic	< 0.0200	< 0.0200	< 0.0200
18:0 Stearic	0.665	0.483	0.542
18:0 Stearic	0.662	0.484	0.529
18:1 Elaidic	< 0.0200	< 0.0200	< 0.0200
18:1 Elaidic	< 0.0200	< 0.0200	< 0.0200
18:1 Oleic	3.41	11.9	10.9
18:1 Oleic	3.39	11.9	10.8
18:2 Linolelaidic	< 0.0200	< 0.0200	< 0.0200
18:2 Linolelaidic	< 0.0200	< 0.0200	< 0.0200
18:2 Other Trans	< 0.0200	< 0.0200	< 0.0200
18:2 Other Trans	< 0.0200	< 0.0200	< 0.0200
18:2 6c,9c Octadecadienoic	< 0.0200	< 0.0200	< 0.0200
18:2 6c,9c Octadecadienoic	< 0.0200	< 0.0200	< 0.0200
18:2 Linoleic	7.57	2.41	2.44
18:2 Linoleic	7.54	2.41	2.42
18:2 9c,15c Octadecadienoic	< 0.0200	< 0.0200	< 0.0200
18:2 9c,15c Octadecadienoic	< 0.0200	< 0.0200	< 0.0200
20:0 Arachidic	0.0493	0.0429	0.0479
20:0 Arachidic	0.0488	0.0428	0.0469

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

<b>Sample Number</b>	07018319-00007	07018319-00014	07018319-00015
<b>Material Name</b>	A3525	MON 87705	MON 87705
<b>Field Site</b>	IA	IL	IL
<b>Replicate</b>	2	1	2
<b>Covance LIMS Number</b>	80408263	80408262	80408259
<b>Fatty Acids (%)</b>			
18:3 Gamma Linolenic	< 0.0200	< 0.0200	< 0.0200
18:3 Gamma Linolenic	< 0.0200	< 0.0200	< 0.0200
18:3 9c,12c,15t Octadecatrienoic	< 0.0200	< 0.0200	< 0.0200
18:3 9c,12c,15t Octadecatrienoic	< 0.0200	< 0.0200	< 0.0200
18:3 Other 18:3 Trans	< 0.0200	< 0.0200	< 0.0200
18:3 Other 18:3 Trans	< 0.0200	< 0.0200	< 0.0200
20:1 Eicosenoic	0.0238	0.0604	0.0532
20:1 Eicosenoic	0.0237	0.0594	0.0516
18:3 Linolenic	1.15	1.02	0.899
18:3 Linolenic	1.14	1.02	0.890
18:4 6c,9c,12c,15t			
Octadecatetraenoic	< 0.0200	< 0.0200	< 0.0200
18:4 6c,9c,12c,15t			
Octadecatetraenoic	< 0.0200	< 0.0200	< 0.0200
18:4 Stearidonic (SDA)	< 0.0200	< 0.0200	< 0.0200
18:4 Stearidonic (SDA)	< 0.0200	< 0.0200	< 0.0200
20:2 11c,14c Eicosadienoic	< 0.0200	< 0.0200	< 0.0200
20:2 11c,14c Eicosadienoic	< 0.0200	< 0.0200	< 0.0200
22:0 Behenic	0.0453	0.0477	0.0537
22:0 Behenic	0.0464	0.0481	0.0511
22:1 Erucic	< 0.0200	< 0.0200	< 0.0200
22:1 Erucic	< 0.0200	< 0.0200	< 0.0200
20:3 11c,14c,17c Eicosatrienoic	< 0.0200	< 0.0200	< 0.0200
20:3 11c,14c,17c Eicosatrienoic	< 0.0200	< 0.0200	< 0.0200
20:4 Arachidonic	< 0.0200	< 0.0200	< 0.0200
20:4 Arachidonic	< 0.0200	< 0.0200	< 0.0200
20:5 5c,8c,11c,14c,17c			
Eicosapentaenoic (EPA)	< 0.0200	< 0.0200	< 0.0200
20:5 5c,8c,11c,14c,17c			
Eicosapentaenoic (EPA)	< 0.0200	< 0.0200	< 0.0200
24:0 Lignoceric	< 0.0200	0.0261	0.0284
24:0 Lignoceric	< 0.0200	0.0259	0.0278
24:1 Nervonic	< 0.0200	< 0.0200	< 0.0200
24:1 Nervonic	< 0.0200	< 0.0200	< 0.0200
22:5 7c,10c,13c,16c,19c			
Docosapentaenoic (DPA)	< 0.0200	< 0.0200	< 0.0200
22:5 7c,10c,13c,16c,19c			
Docosapentaenoic (DPA)	< 0.0200	< 0.0200	< 0.0200

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

<b>Sample Number</b>	07018319-00007	07018319-00014	07018319-00015
<b>Material Name</b>	A3525	MON 87705	MON 87705
<b>Field Site</b>	IA	IL	IL
<b>Replicate</b>	2	1	2
<b>Covance LIMS Number</b>	80408263	80408262	80408259
<b>Fatty Acids (%)</b>			
22:6 4c,7c,10c,13c,16c,19c			
Docosahexaenoic (DHA)	< 0.0200	< 0.0200	< 0.0200
22:6 4c,7c,10c,13c,16c,19c			
Docosahexaenoic (DHA)	< 0.0200	< 0.0200	< 0.0200



**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

<b>Sample Number</b>	07018319-00009	07018318-00005
<b>Material Name</b>	MON 87705	MON 87705
<b>Field Site</b>	IA	IA
<b>Replicate</b>	1	2
<b>Covance LIMS Number</b>	80408258	80408260
<b>Proximate (%)</b>		
Moisture	8.39	8.14
Moisture	8.42	8.20
Protein	38.1	37.9
Protein	38.5	37.8
Total Fat	14.4	14.3
Total Fat	14.7	14.6
Ash	4.50	4.71
Ash	4.46	4.42
Carbohydrates	34.6	35.0
Carbohydrates	34.0	35.0
Acid Detergent Fiber (%)	14.7	16.2
Acid Detergent Fiber (%)	14.3	13.6
Neutral Detergent Fiber (%)	15.3	16.6
Neutral Detergent Fiber (%)	14.4	16.1
Phytic Acid (%)	1.12	1.14
Phytic Acid (%)	1.09	1.12
Lectin (H.U./mg)*	2.00	1.48
Lectin (H.U./mg)*	0.876	0.766
Raffinose (%)	0.376	0.351
Raffinose (%)	0.368	0.350
Stachyose (%)	3.43	3.27
Stachyose (%)	3.41	3.26
Trypsin Inhibitor (TIU/mg)**	23.9	20.4
Trypsin Inhibitor (TIU/mg)**	24.7	24.7
Vitamin E (mg/100g)	1.52	1.54
Vitamin E (mg/100g)	1.53	1.63
<b>Isoflavones (µg/g)</b>		
Daidzein	1390	1350
Daidzein	1390	1360
Glycitein	92.7	87.3
Glycitein	107	89.4
Genistein	859	831
Genistein	843	815

\* H.U. - Hemagglutinating Unit

\*\*TIU - Trypsin Inhibitor Unit

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

<b>Sample Number</b>	07018319-00009	07018318-00005
<b>Material Name</b>	MON 87705	MON 87705
<b>Field Site</b>	IA	IA
<b>Replicate</b>	1	2
<b>Covance LIMS Number</b>	80408258	80408260
<b>Amino Acids (mg/g)</b>		
Aspartic Acid	42.3	42.6
Aspartic Acid	42.4	41.5
Threonine	13.9	13.9
Threonine	14.0	13.7
Serine	18.5	18.8
Serine	18.3	18.0
Glutamic Acid	68.1	68.9
Glutamic Acid	68.3	66.8
Proline	18.0	17.7
Proline	17.8	17.8
Glycine	16.4	16.4
Glycine	16.3	16.2
Alanine	16.2	16.4
Alanine	16.0	16.0
Cystine	5.28	5.21
Cystine	5.29	5.38
Valine	18.7	18.8
Valine	18.7	18.4
Methionine	5.02	5.09
Methionine	5.12	5.05
Isoleucine	17.4	17.6
Isoleucine	17.4	17.1
Leucine	28.4	28.7
Leucine	28.5	28.0
Tyrosine	12.8	12.4
Tyrosine	12.1	12.4
Phenylalanine	19.3	19.5
Phenylalanine	18.7	19.0
Lysine	24.3	24.4
Lysine	24.2	23.9
Histidine	9.94	9.97
Histidine	9.93	9.75
Arginine	30.8	30.1
Arginine	30.5	29.7
Tryptophan	4.38	4.41
Tryptophan	4.43	4.38

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

<b>Sample Number</b>	07018319-00009	07018318-00005
<b>Material Name</b>	MON 87705	MON 87705
<b>Field Site</b>	IA	IA
<b>Replicate</b>	1	2
<b>Covance LIMS Number</b>	80408258	80408260
<b>Fatty Acids (%)</b>		
8:0 Caprylic	< 0.0200	< 0.0200
8:0 Caprylic	< 0.0200	< 0.0200
10:0 Capric	< 0.0200	< 0.0200
10:0 Capric	< 0.0200	< 0.0200
12:0 Lauric	< 0.0200	< 0.0200
12:0 Lauric	< 0.0200	< 0.0200
14:0 Myristic	< 0.0200	< 0.0200
14:0 Myristic	< 0.0200	< 0.0200
14:1 Myristoleic	< 0.0200	< 0.0200
14:1 Myristoleic	< 0.0200	< 0.0200
15:0 Pentadecanoic	< 0.0200	< 0.0200
15:0 Pentadecanoic	< 0.0200	< 0.0200
15:1 10c Pentadecenoic	< 0.0200	< 0.0200
15:1 10c Pentadecenoic	< 0.0200	< 0.0200
16:0 Palmitic	0.356	0.353
16:0 Palmitic	0.358	0.353
16:1 9t Palmitelaidic	< 0.0200	< 0.0200
16:1 9t Palmitelaidic	< 0.0200	< 0.0200
16:1 9c Palmitoleic	< 0.0200	< 0.0200
16:1 9c Palmitoleic	< 0.0200	< 0.0200
17:0 Margaric	< 0.0200	< 0.0200
17:0 Margaric	< 0.0200	< 0.0200
17:1 9c Heptadecenoic	0.0201	0.0200
17:1 9c Heptadecenoic	0.0202	< 0.0200
18:0 Stearic	0.462	0.450
18:0 Stearic	0.469	0.450
18:1 Elaidic	< 0.0200	< 0.0200
18:1 Elaidic	< 0.0200	< 0.0200
18:1 Oleic	10.3	10.3
18:1 Oleic	10.5	10.3
18:2 Linolelaidic	< 0.0200	< 0.0200
18:2 Linolelaidic	< 0.0200	< 0.0200
18:2 Other Trans	< 0.0200	< 0.0200
18:2 Other Trans	< 0.0200	< 0.0200
18:2 6c,9c Octadecadienoic	< 0.0200	< 0.0200
18:2 6c,9c Octadecadienoic	< 0.0200	< 0.0200
18:2 Linoleic	1.58	1.67
18:2 Linoleic	1.60	1.67
18:2 9c,15c Octadecadienoic	< 0.0200	< 0.0200
18:2 9c,15c Octadecadienoic	< 0.0200	< 0.0200
20:0 Arachidic	0.0381	0.0381
20:0 Arachidic	0.0381	0.0375

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

<b>Sample Number</b>	07018319-00009	07018318-00005
<b>Material Name</b>	MON 87705	MON 87705
<b>Field Site</b>	IA	IA
<b>Replicate</b>	1	2
<b>Covance LIMS Number</b>	80408258	80408260
<b>Fatty Acids (%)</b>		
18:3 Gamma Linolenic	< 0.0200	< 0.0200
18:3 Gamma Linolenic	< 0.0200	< 0.0200
18:3 9c,12c,15t Octadecatrienoic	< 0.0200	< 0.0200
18:3 9c,12c,15t Octadecatrienoic	< 0.0200	< 0.0200
18:3 Other 18:3 Trans	< 0.0200	< 0.0200
18:3 Other 18:3 Trans	< 0.0200	< 0.0200
20:1 Eicosenoic	0.0397	0.0413
20:1 Eicosenoic	0.0403	0.0411
18:3 Linolenic	1.00	1.05
18:3 Linolenic	1.00	1.05
18:4 6c,9c,12c,15t		
Octadecatetraenoic	< 0.0200	< 0.0200
18:4 6c,9c,12c,15t		
Octadecatetraenoic	< 0.0200	< 0.0200
18:4 Stearidonic (SDA)	< 0.0200	< 0.0200
18:4 Stearidonic (SDA)	< 0.0200	< 0.0200
20:2 11c,14c Eicosadienoic	< 0.0200	< 0.0200
20:2 11c,14c Eicosadienoic	< 0.0200	< 0.0200
22:0 Behenic	0.0396	0.0402
22:0 Behenic	0.0409	0.0399
22:1 Erucic	< 0.0200	< 0.0200
22:1 Erucic	< 0.0200	< 0.0200
20:3 11c,14c,17c Eicosatrienoic	< 0.0200	< 0.0200
20:3 11c,14c,17c Eicosatrienoic	< 0.0200	< 0.0200
20:4 Arachidonic	< 0.0200	< 0.0200
20:4 Arachidonic	< 0.0200	< 0.0200
20:5 5c,8c,11c,14c,17c		
Eicosapentaenoic (EPA)	< 0.0200	< 0.0200
20:5 5c,8c,11c,14c,17c		
Eicosapentaenoic (EPA)	< 0.0200	< 0.0200
24:0 Lignoceric	< 0.0200	< 0.0200
24:0 Lignoceric	< 0.0200	< 0.0200
24:1 Nervonic	< 0.0200	< 0.0200
24:1 Nervonic	< 0.0200	< 0.0200
22:5 7c,10c,13c,16c,19c		
Docosapentaenoic (DPA)	< 0.0200	< 0.0200
22:5 7c,10c,13c,16c,19c		
Docosapentaenoic (DPA)	< 0.0200	< 0.0200

**Table 1**  
**Compositional Analyses**  
**of Soybean Seed**

<b>Sample Number</b>	07018319-00009	07018318-00005
<b>Material Name</b>	MON 87705	MON 87705
<b>Field Site</b>	IA	IA
<b>Replicate</b>	1	2
<b>Covance LIMS Number</b>	80408258	80408260
<b>Fatty Acids (%)</b>		
22:6 4c,7c,10c,13c,16c,19c		
Docosahexaenoic (DHA)	< 0.0200	< 0.0200
22:6 4c,7c,10c,13c,16c,19c		
Docosahexaenoic (DHA)	< 0.0200	< 0.0200

**Table 2**  
**Compositional Analyses**  
**of Soybean Meal**

<b>Sample Number</b>	RPN08024-009	RPN08024-013	RPN08024-001
<b>Material Name</b>	A3525	A3525	A3525
<b>Field Site</b>	IL	IL	IA
<b>Replicate</b>	1	2	1
<b>Covance LIMS Number</b>	80600617	80600616	80600622
<b>Proximate (%)</b>			
Moisture	12.5	4.29	4.09
Moisture	12.5	4.29	3.79
Protein	47.6	53.3	50.4
Protein	47.8	53.6	50.5
Total Fat	0.496	0.954	0.810
Total Fat	0.717	0.953	0.770
Ash	6.73	7.15	6.79
Ash	6.85	7.18	6.70
Carbohydrates	32.7	34.3	37.9
Carbohydrates	32.1	34.0	38.2
Acid Detergent Fiber (%)	4.75	5.46	5.97
Acid Detergent Fiber (%)	4.59	5.21	6.91
Neutral Detergent Fiber (%)	5.31	6.06	6.42
Neutral Detergent Fiber (%)	5.65	6.27	7.13
Phytic Acid (%)	1.25	1.39	1.44
Phytic Acid (%)	1.27	1.40	1.52
Trypsin Inhibitor (TIU/mg)**	2.05	1.84	< 1.00
Trypsin Inhibitor (TIU/mg)**	1.58	1.93	1.51

\*\*TIU - Trypsin Inhibitor Unit

**Table 2**  
**Compositional Analyses**  
**of Soybean Meal**

Sample Number	RPN08024-009	RPN08024-013	RPN08024-001
Material Name	A3525	A3525	A3525
Field Site	IL	IL	IA
Replicate	1	2	1
Covance LIMS Number	80600617	80600616	80600622
<b>Amino Acids (mg/g)</b>			
Aspartic Acid	54.4	60.4	57.8
Aspartic Acid	54.0	60.6	57.2
Threonine	19.1	20.9	19.7
Threonine	19.1	20.6	19.7
Serine	24.6	26.9	25.1
Serine	24.5	26.7	25.0
Glutamic Acid	86.2	95.3	91.6
Glutamic Acid	85.3	95.8	90.5
Proline	24.7	27.2	25.6
Proline	24.2	27.3	25.3
Glycine	20.5	22.8	22.0
Glycine	20.5	22.8	21.9
Alanine	20.6	22.8	21.8
Alanine	20.6	22.8	21.7
Cystine	7.57	7.80	7.49
Cystine	7.61	7.74	7.54
Valine	22.9	25.4	25.4
Valine	22.7	26.0	25.1
Methionine	7.74	8.01	7.64
Methionine	7.81	7.94	7.59
Isoleucine	22.1	24.5	24.2
Isoleucine	21.9	24.9	23.9
Leucine	36.5	40.3	39.0
Leucine	36.3	40.5	38.7
Tyrosine	16.8	18.4	17.6
Tyrosine	16.6	18.0	17.1
Phenylalanine	24.7	27.3	26.3
Phenylalanine	24.3	27.4	25.8
Lysine	29.4	32.4	31.6
Lysine	29.2	32.5	31.5
Histidine	12.6	14.3	13.4
Histidine	12.6	14.4	13.3
Arginine	37.1	43.0	40.3
Arginine	37.0	43.0	39.9
Tryptophan	5.32	6.17	5.45
Tryptophan	5.33	6.15	5.52

**Table 2**  
**Compositional Analyses**  
**of Soybean Meal**

<b>Sample Number</b>	RPN08024-005	RPN08024-025	RPN08024-029
<b>Material Name</b>	A3525	MON 87705	MON 87705
<b>Field Site</b>	IA	IL	IL
<b>Replicate</b>	2	1	2
<b>Covance LIMS Number</b>	80600618	80600619	80600623
<b>Proximate (%)</b>			
Moisture	6.70	2.76	3.88
Moisture	6.71	2.67	3.94
Protein	50.0	50.6	52.1
Protein	50.3	50.6	52.0
Total Fat	0.871	0.836	1.02
Total Fat	0.864	0.792	0.973
Ash	6.44	7.20	6.82
Ash	6.39	7.01	6.78
Carbohydrates	36.0	38.6	36.2
Carbohydrates	35.7	38.9	36.3
Acid Detergent Fiber (%)	5.69	6.49	6.24
Acid Detergent Fiber (%)	5.79	6.91	6.40
Neutral Detergent Fiber (%)	7.06	9.03	7.95
Neutral Detergent Fiber (%)	6.93	8.40	7.86
Phytic Acid (%)	1.33	1.23	1.24
Phytic Acid (%)	1.36	1.24	1.33
Trypsin Inhibitor (TIU/mg)**	< 1.00	2.88	< 1.00
Trypsin Inhibitor (TIU/mg)**	< 1.00	1.54	< 1.00

\*\*TIU - Trypsin Inhibitor Unit



**Table 2**  
**Compositional Analyses**  
**of Soybean Meal**

Sample Number	RPN08024-005	RPN08024-025	RPN08024-029
Material Name	A3525	MON 87705	MON 87705
Field Site	IA	IL	IL
Replicate	2	1	2
Covance LIMS Number	80600618	80600619	80600623
<b>Amino Acids (mg/g)</b>			
Aspartic Acid	56.9	57.3	58.0
Aspartic Acid	57.6	56.2	60.0
Threonine	19.6	20.2	20.3
Threonine	19.7	20.2	19.9
Serine	25.3	25.5	26.1
Serine	25.3	25.6	25.6
Glutamic Acid	91.3	90.2	91.6
Glutamic Acid	92.3	88.3	94.9
Proline	25.6	25.3	26.3
Proline	25.7	25.2	26.8
Glycine	21.7	22.2	22.0
Glycine	21.8	21.9	22.7
Alanine	21.5	22.2	21.7
Alanine	21.6	21.9	22.4
Cystine	7.27	8.75	8.11
Cystine	7.56	8.73	8.08
Valine	24.6	25.0	23.8
Valine	24.9	24.0	26.1
Methionine	7.89	8.73	8.12
Methionine	8.04	8.57	8.03
Isoleucine	23.3	23.9	23.1
Isoleucine	23.6	23.1	25.1
Leucine	38.3	38.7	39.0
Leucine	38.5	38.0	40.4
Tyrosine	16.0	18.0	17.5
Tyrosine	17.6	17.8	18.1
Phenylalanine	25.9	26.0	26.2
Phenylalanine	26.2	25.5	27.3
Lysine	30.9	31.5	31.1
Lysine	31.1	31.1	32.2
Histidine	13.2	13.5	13.5
Histidine	13.2	13.3	14.0
Arginine	39.9	39.3	41.1
Arginine	41.4	38.7	42.9
Tryptophan	5.50	5.89	5.93
Tryptophan	5.56	5.88	6.03

**Table 2**  
**Compositional Analyses**  
**of Soybean Meal**

<b>Sample Number</b>	RPN08024-017	RPN08024-021
<b>Material Name</b>	MON 87705	MON 87705
<b>Field Site</b>	IA	IA
<b>Replicate</b>	1	2
<b>Covance LIMS Number</b>	80600621	80600620
<b>Proximate (%)</b>		
Moisture	3.04	3.53
Moisture	3.18	3.64
Protein	51.0	50.7
Protein	51.7	50.5
Total Fat	0.560	0.630
Total Fat	0.622	0.605
Ash	6.59	6.69
Ash	6.47	6.52
Carbohydrates	38.8	38.5
Carbohydrates	38.0	38.7
Acid Detergent Fiber (%)	5.83	6.55
Acid Detergent Fiber (%)	5.72	6.41
Neutral Detergent Fiber (%)	7.86	8.58
Neutral Detergent Fiber (%)	7.74	8.70
Phytic Acid (%)	1.38	1.37
Phytic Acid (%)	1.40	1.39
Trypsin Inhibitor (TIU/mg)**	2.26	4.05
Trypsin Inhibitor (TIU/mg)**	1.07	3.83

\*\*TIU - Trypsin Inhibitor Unit

**Table 2**  
**Compositional Analyses**  
**of Soybean Meal**

<b>Sample Number</b>	RPN08024-017	RPN08024-021
<b>Material Name</b>	MON 87705	MON 87705
<b>Field Site</b>	IA	IA
<b>Replicate</b>	1	2
<b>Covance LIMS Number</b>	80600621	80600620
<b>Amino Acids (mg/g)</b>		
Aspartic Acid	57.4	57.0
Aspartic Acid	57.8	56.7
Threonine	19.9	19.2
Threonine	20.2	19.2
Serine	25.4	24.9
Serine	26.1	24.8
Glutamic Acid	91.5	90.1
Glutamic Acid	92.3	90.2
Proline	25.4	25.4
Proline	25.5	25.2
Glycine	21.9	21.8
Glycine	22.0	21.7
Alanine	21.7	21.5
Alanine	21.7	21.4
Cystine	7.55	7.11
Cystine	7.48	7.28
Valine	24.5	25.0
Valine	24.1	24.8
Methionine	7.67	7.25
Methionine	7.74	7.38
Isoleucine	23.4	23.9
Isoleucine	23.2	23.6
Leucine	38.6	38.8
Leucine	39.0	38.5
Tyrosine	17.7	17.4
Tyrosine	17.8	17.0
Phenylalanine	26.1	25.9
Phenylalanine	26.2	25.4
Lysine	31.4	31.4
Lysine	31.7	31.2
Histidine	13.4	13.4
Histidine	13.6	13.2
Arginine	41.7	40.8
Arginine	41.6	40.5
Tryptophan	5.90	5.33
Tryptophan	5.83	5.69

**Table 3**  
**Compositional Analyses**  
**of Soybean RBD Oil**

Sample Number	RPN08024-010	RPN08024-014	RPN08024-002
Material Name	A3525	A3525	A3525
Field Site	IL	IL	IA
Replicate	1	2	1
Covance Number (Vitamin E)	80600628	80600631	80600626
Covance Number (Fatty Acids)	80502774	80502775	80502772
Vitamin E (mg/100g)	16.5	20.1	8.42
Vitamin E (mg/100g)	15.2	20.6	8.47
<b>Fatty Acids (%)</b>			
8:0 Caprylic	< 0.0600	< 0.0600	< 0.0600
8:0 Caprylic	< 0.0600	< 0.0600	< 0.0600
10:0 Capric	< 0.0600	< 0.0600	< 0.0600
10:0 Capric	< 0.0600	< 0.0600	< 0.0600
12:0 Lauric	< 0.0600	< 0.0600	< 0.0600
12:0 Lauric	< 0.0600	< 0.0600	< 0.0600
14:0 Myristic	0.0867	0.0918	0.0799
14:0 Myristic	0.0892	0.0926	0.0855
14:1 Myristoleic	< 0.0600	< 0.0600	< 0.0600
14:1 Myristoleic	< 0.0600	< 0.0600	< 0.0600
15:0 Pentadecanoic	< 0.0600	< 0.0600	< 0.0600
15:0 Pentadecanoic	< 0.0600	< 0.0600	< 0.0600
15:1 10c Pentadecenoic	< 0.0600	< 0.0600	< 0.0600
15:1 10c Pentadecenoic	< 0.0600	< 0.0600	< 0.0600
16:0 Palmitic	11.0	10.8	11.1
16:0 Palmitic	11.0	10.8	11.1
16:1 9t Palmitelaidic	< 0.0600	< 0.0600	< 0.0600
16:1 9t Palmitelaidic	< 0.0600	< 0.0600	< 0.0600
16:1 9c Palmitoleic	0.0890	0.104	0.103
16:1 9c Palmitoleic	0.0942	0.105	0.0948
17:0 Margaric	0.0849	0.0831	0.111
17:0 Margaric	0.0870	0.0799	0.114
17:1 9c Heptadecenoic	< 0.0600	< 0.0600	< 0.0600
17:1 9c Heptadecenoic	< 0.0600	< 0.0600	< 0.0600
18:0 Stearic	4.14	4.36	4.25
18:0 Stearic	4.16	4.35	4.22
18:1 Elaidic	< 0.0600	< 0.0600	< 0.0600
18:1 Elaidic	< 0.0600	< 0.0600	< 0.0600
18:1 Oleic	22.1	24.4	20.5
18:1 Oleic	22.2	24.4	20.4
18:2 Linolelaidic	< 0.0600	< 0.0600	< 0.0600
18:2 Linolelaidic	< 0.0600	< 0.0600	< 0.0600
18:2 Other Trans	0.605	0.581	0.633
18:2 Other Trans	0.608	0.574	0.634
18:2 6c,9c Octadecadienoic	0.625	0.609	0.661
18:2 6c,9c Octadecadienoic	0.631	0.604	0.659

**Table 3**  
**Compositional Analyses**  
**of Soybean RBD Oil**

Sample Number	RPN08024-010	RPN08024-014	RPN08024-002
Material Name	A3525	A3525	A3525
Field Site	IL	IL	IA
Replicate	1	2	1
Covance Number (Vitamin E)	80600628	80600631	80600626
Covance Number (Fatty Acids)	80502774	80502775	80502772
<b>Fatty Acids (%)</b>			
18:2 Linoleic	49.7	47.7	49.3
18:2 Linoleic	50.0	47.7	48.9
18:2 9c,15c Octadecadienoic	< 0.0600	< 0.0600	< 0.0600
18:2 9c,15c Octadecadienoic	< 0.0600	< 0.0600	< 0.0600
20:0 Arachidic	0.342	0.364	0.331
20:0 Arachidic	0.347	0.364	0.326
18:3 Gamma Linolenic	< 0.0600	< 0.0600	< 0.0600
18:3 Gamma Linolenic	< 0.0600	< 0.0600	< 0.0600
18:3 9c,12c,15t Octadecatrienoic	0.825	0.759	1.13
18:3 9c,12c,15t Octadecatrienoic	0.830	0.757	1.14
18:3 Other 18:3 Trans	0.811	0.739	1.11
18:3 Other 18:3 Trans	0.814	0.746	1.09
20:1 Eicosenoic	0.204	0.201	0.166
20:1 Eicosenoic	0.200	0.204	0.162
18:3 Linolenic	4.38	4.02	5.71
18:3 Linolenic	4.40	4.01	5.66
18:4 6c,9c,12c,15t Octadecatetraenoic	< 0.0600	< 0.0600	< 0.0600
18:4 6c,9c,12c,15t Octadecatetraenoic	< 0.0600	< 0.0600	< 0.0600
18:4 Stearidonic (SDA)	< 0.0600	< 0.0600	< 0.0600
18:4 Stearidonic (SDA)	< 0.0600	< 0.0600	< 0.0600
20:2 11c,14c Eicosadienoic	< 0.0600	< 0.0600	< 0.0600
20:2 11c,14c Eicosadienoic	< 0.0600	< 0.0600	< 0.0600
22:0 Behenic	0.335	0.358	0.315
22:0 Behenic	0.336	0.360	0.313
22:1 Erucic	< 0.0600	< 0.0600	< 0.0600
22:1 Erucic	< 0.0600	< 0.0600	< 0.0600
20:3 11c,14c,17c Eicosatrienoic	< 0.0600	< 0.0600	< 0.0600
20:3 11c,14c,17c Eicosatrienoic	< 0.0600	< 0.0600	< 0.0600
20:4 Arachidonic	< 0.0600	< 0.0600	< 0.0600
20:4 Arachidonic	< 0.0600	< 0.0600	< 0.0600
20:5 5c,8c,11c,14c,17c Eicosapentaenoic (EPA)	< 0.0600	< 0.0600	< 0.0600
20:5 5c,8c,11c,14c,17c Eicosapentaenoic (EPA)	< 0.0600	< 0.0600	< 0.0600

**Table 3**  
**Compositional Analyses**  
**of Soybean RBD Oil**

<b>Sample Number</b>	RPN08024-010	RPN08024-014	RPN08024-002
<b>Material Name</b>	A3525	A3525	A3525
<b>Field Site</b>	IL	IL	IA
<b>Replicate</b>	1	2	1
<b>Covance Number (Vitamin E)</b>	80600628	80600631	80600626
<b>Covance Number (Fatty Acids)</b>	80502774	80502775	80502772
<b>Fatty Acids (%)</b>			
24:0 Lignoceric	0.165	0.179	0.117
24:0 Lignoceric	0.167	0.180	0.109
24:1 Nervonic	< 0.0600	< 0.0600	< 0.0600
24:1 Nervonic	< 0.0600	< 0.0600	< 0.0600
22:5 7c,10c,13c,16c,19c Docosapentaenoic (DPA)	< 0.0600	< 0.0600	< 0.0600
22:5 7c,10c,13c,16c,19c Docosapentaenoic (DPA)	< 0.0600	< 0.0600	< 0.0600
22:6 4c,7c,10c,13c,16c,19c Docosahexaenoic (DHA)	< 0.0600	< 0.0600	< 0.0600
22:6 4c,7c,10c,13c,16c,19c Docosahexaenoic (DHA)	< 0.0600	< 0.0600	< 0.0600

**Table 3**  
**Compositional Analyses**  
**of Soybean RBD Oil**

<b>Sample Number</b>	<b>RPN08024-006</b>	<b>RPN08024-026</b>	<b>RPN08024-030</b>
<b>Material Name</b>	A3525	MON 87705	MON 87705
<b>Field Site</b>	IA	IL	IL
<b>Replicate</b>	2	1	2
<b>Covance Number (Vitamin E)</b>	80600627	80600629	80600625
<b>Covance Number (Fatty Acids)</b>	80502773	80502778	80502779
Vitamin E (mg/100g)	7.80	16.0	17.1
Vitamin E (mg/100g)	7.64	15.7	17.6
<b>Fatty Acids (%)</b>			
8:0 Caprylic	< 0.0600	< 0.0600	< 0.0600
8:0 Caprylic	< 0.0600	< 0.0600	< 0.0600
10:0 Capric	< 0.0600	< 0.0600	< 0.0600
10:0 Capric	< 0.0600	< 0.0600	< 0.0600
12:0 Lauric	< 0.0600	< 0.0600	< 0.0600
12:0 Lauric	< 0.0600	< 0.0600	< 0.0600
14:0 Myristic	0.0837	< 0.0600	< 0.0600
14:0 Myristic	0.0803	< 0.0600	< 0.0600
14:1 Myristoleic	< 0.0600	< 0.0600	< 0.0600
14:1 Myristoleic	< 0.0600	< 0.0600	< 0.0600
15:0 Pentadecanoic	< 0.0600	< 0.0600	< 0.0600
15:0 Pentadecanoic	< 0.0600	< 0.0600	< 0.0600
15:1 10c Pentadecenoic	< 0.0600	< 0.0600	< 0.0600
15:1 10c Pentadecenoic	< 0.0600	< 0.0600	< 0.0600
16:0 Palmitic	11.4	2.24	2.29
16:0 Palmitic	11.2	2.25	2.30
16:1 9t Palmitelaidic	< 0.0600	< 0.0600	< 0.0600
16:1 9t Palmitelaidic	< 0.0600	< 0.0600	< 0.0600
16:1 9c Palmitoleic	0.105	0.108	0.123
16:1 9c Palmitoleic	0.108	0.111	0.123
17:0 Margaric	0.114	< 0.0600	< 0.0600
17:0 Margaric	0.112	< 0.0600	< 0.0600
17:1 9c Heptadecenoic	< 0.0600	0.0887	0.0983
17:1 9c Heptadecenoic	< 0.0600	0.0867	0.0979
18:0 Stearic	4.36	2.85	3.23
18:0 Stearic	4.30	2.85	3.27
18:1 Elaidic	< 0.0600	< 0.0600	0.0883
18:1 Elaidic	< 0.0600	0.0949	0.0892
18:1 Oleic	21.6	65.9	67.8
18:1 Oleic	21.3	65.9	68.1
18:2 Linolelaidic	< 0.0600	< 0.0600	< 0.0600
18:2 Linolelaidic	< 0.0600	< 0.0600	< 0.0600
18:2 Other Trans	0.582	0.209	0.195
18:2 Other Trans	0.570	0.223	0.191
18:2 6c,9c Octadecadienoic	0.608	0.220	0.219
18:2 6c,9c Octadecadienoic	0.601	0.243	0.197

**Table 3**  
**Compositional Analyses**  
**of Soybean RBD Oil**

Sample Number	RPN08024-006	RPN08024-026	RPN08024-030
Material Name	A3525	MON 87705	MON 87705
Field Site	IA	IL	IL
Replicate	2	1	2
Covance Number (Vitamin E)	80600627	80600629	80600625
Covance Number (Fatty Acids)	80502773	80502778	80502779
<b>Fatty Acids (%)</b>			
18:2 Linoleic	48.7	16.5	14.7
18:2 Linoleic	48.0	16.6	14.7
18:2 9c,15c Octadecadienoic	< 0.0600	< 0.0600	< 0.0600
18:2 9c,15c Octadecadienoic	< 0.0600	< 0.0600	0.0631
20:0 Arachidic	0.340	0.257	0.296
20:0 Arachidic	0.329	0.261	0.305
18:3 Gamma Linolenic	< 0.0600	< 0.0600	< 0.0600
18:3 Gamma Linolenic	< 0.0600	< 0.0600	< 0.0600
18:3 9c,12c,15t Octadecatrienoic	1.02	0.831	0.775
18:3 9c,12c,15t Octadecatrienoic	1.01	0.830	0.770
18:3 Other 18:3 Trans	0.842	0.836	0.774
18:3 Other 18:3 Trans	0.977	0.837	0.780
20:1 Eicosenoic	0.165	0.354	0.339
20:1 Eicosenoic	0.155	0.347	0.352
18:3 Linolenic	5.54	4.13	3.89
18:3 Linolenic	5.45	4.13	3.90
18:4 6c,9c,12c,15t Octadecatetraenoic	< 0.0600	< 0.0600	< 0.0600
18:4 6c,9c,12c,15t Octadecatetraenoic	< 0.0600	< 0.0600	< 0.0600
18:4 Stearidonic (SDA)	< 0.0600	< 0.0600	< 0.0600
18:4 Stearidonic (SDA)	< 0.0600	< 0.0600	< 0.0600
20:2 11c,14c Eicosadienoic	< 0.0600	< 0.0600	< 0.0600
20:2 11c,14c Eicosadienoic	< 0.0600	< 0.0600	< 0.0600
22:0 Behenic	0.321	0.299	0.328
22:0 Behenic	0.316	0.289	0.333
22:1 Erucic	< 0.0600	< 0.0600	< 0.0600
22:1 Erucic	< 0.0600	< 0.0600	< 0.0600
20:3 11c,14c,17c Eicosatrienoic	< 0.0600	< 0.0600	< 0.0600
20:3 11c,14c,17c Eicosatrienoic	< 0.0600	< 0.0600	< 0.0600
20:4 Arachidonic	< 0.0600	< 0.0600	< 0.0600
20:4 Arachidonic	< 0.0600	< 0.0600	< 0.0600
20:5 5c,8c,11c,14c,17c Eicosapentaenoic (EPA)	< 0.0600	< 0.0600	< 0.0600
20:5 5c,8c,11c,14c,17c Eicosapentaenoic (EPA)	< 0.0600	< 0.0600	< 0.0600



**Table 3**  
**Compositional Analyses**  
**of Soybean RBD Oil**

<b>Sample Number</b>	RPN08024-006	RPN08024-026	RPN08024-030
<b>Material Name</b>	A3525	MON 87705	MON 87705
<b>Field Site</b>	IA	IL	IL
<b>Replicate</b>	2	1	2
<b>Covance Number (Vitamin E)</b>	80600627	80600629	80600625
<b>Covance Number (Fatty Acids)</b>	80502773	80502778	80502779
<b>Fatty Acids (%)</b>			
24:0 Lignoceric	0.109	0.155	0.168
24:0 Lignoceric	0.102	0.151	0.172
24:1 Nervonic	< 0.0600	< 0.0600	< 0.0600
24:1 Nervonic	< 0.0600	< 0.0600	< 0.0600
22:5 7c,10c,13c,16c,19c Docosapentaenoic (DPA)	< 0.0600	< 0.0600	< 0.0600
22:5 7c,10c,13c,16c,19c Docosapentaenoic (DPA)	< 0.0600	< 0.0600	< 0.0600
22:6 4c,7c,10c,13c,16c,19c Docosahexaenoic (DHA)	< 0.0600	< 0.0600	< 0.0600
22:6 4c,7c,10c,13c,16c,19c Docosahexaenoic (DHA)	< 0.0600	< 0.0600	< 0.0600

**Table 3**  
**Compositional Analyses**  
**of Soybean RBD Oil**

<b>Sample Number</b>	<b>RPN08024-018</b>	<b>RPN08024-022</b>
<b>Material Name</b>	MON 87705	MON 87705
<b>Field Site</b>	IA	IA
<b>Replicate</b>	1	2
<b>Covance Number (Vitamin E)</b>	80600630	80600624
<b>Covance Number (Fatty Acids)</b>	80502776	80502777
Vitamin E (mg/100g)	6.45	7.28
Vitamin E (mg/100g)	6.28	6.74
<b>Fatty Acids (%)</b>		
8:0 Caprylic	< 0.0600	< 0.0600
8:0 Caprylic	< 0.0600	< 0.0600
10:0 Capric	< 0.0600	< 0.0600
10:0 Capric	< 0.0600	< 0.0600
12:0 Lauric	< 0.0600	< 0.0600
12:0 Lauric	< 0.0600	< 0.0600
14:0 Myristic	< 0.0600	< 0.0600
14:0 Myristic	< 0.0600	< 0.0600
14:1 Myristoleic	< 0.0600	< 0.0600
14:1 Myristoleic	< 0.0600	< 0.0600
15:0 Pentadecanoic	< 0.0600	< 0.0600
15:0 Pentadecanoic	< 0.0600	< 0.0600
15:1 10c Pentadecenoic	< 0.0600	< 0.0600
15:1 10c Pentadecenoic	< 0.0600	< 0.0600
16:0 Palmitic	2.55	2.39
16:0 Palmitic	2.59	2.38
16:1 9t Palmitelaidic	< 0.0600	< 0.0600
16:1 9t Palmitelaidic	< 0.0600	< 0.0600
16:1 9c Palmitoleic	0.133	0.122
16:1 9c Palmitoleic	0.135	0.123
17:0 Margaric	< 0.0600	< 0.0600
17:0 Margaric	0.0626	< 0.0600
17:1 9c Heptadecenoic	0.131	0.135
17:1 9c Heptadecenoic	0.139	0.134
18:0 Stearic	3.13	3.00
18:0 Stearic	3.19	3.01
18:1 Elaidic	< 0.0600	< 0.0600
18:1 Elaidic	< 0.0600	0.0698
18:1 Oleic	68.8	69.4
18:1 Oleic	70.1	69.3
18:2 Linolelaidic	< 0.0600	< 0.0600
18:2 Linolelaidic	< 0.0600	< 0.0600
18:2 Other Trans	0.150	0.133
18:2 Other Trans	0.154	0.135
18:2 6c,9c Octadecadienoic	0.160	0.148
18:2 6c,9c Octadecadienoic	0.166	0.151

**Table 3**  
**Compositional Analyses**  
**of Soybean RBD Oil**

Sample Number	RPN08024-018	RPN08024-022
Material Name	MON 87705	MON 87705
Field Site	IA	IA
Replicate	1	2
Covance Number (Vitamin E)	80600630	80600624
Covance Number (Fatty Acids)	80502776	80502777
<b>Fatty Acids (%)</b>		
18:2 Linoleic	11.9	11.7
18:2 Linoleic	12.1	11.6
18:2 9c,15c Octadecadienoic	0.0847	0.0935
18:2 9c,15c Octadecadienoic	0.0843	0.0842
20:0 Arachidic	0.271	0.265
20:0 Arachidic	0.275	0.262
18:3 Gamma Linolenic	< 0.0600	< 0.0600
18:3 Gamma Linolenic	< 0.0600	< 0.0600
18:3 9c,12c,15t Octadecatrienoic	0.961	0.934
18:3 9c,12c,15t Octadecatrienoic	0.979	0.936
18:3 Other 18:3 Trans	0.952	0.940
18:3 Other 18:3 Trans	0.983	0.935
20:1 Eicosenoic	0.273	0.287
20:1 Eicosenoic	0.284	0.285
18:3 Linolenic	4.87	5.19
18:3 Linolenic	4.96	5.18
18:4 6c,9c,12c,15t Octadecatetraenoic	< 0.0600	< 0.0600
18:4 6c,9c,12c,15t Octadecatetraenoic	< 0.0600	< 0.0600
18:4 Stearidonic (SDA)	< 0.0600	< 0.0600
18:4 Stearidonic (SDA)	< 0.0600	< 0.0600
20:2 11c,14c Eicosadienoic	< 0.0600	< 0.0600
20:2 11c,14c Eicosadienoic	< 0.0600	< 0.0600
22:0 Behenic	0.290	0.279
22:0 Behenic	0.288	0.286
22:1 Erucic	< 0.0600	< 0.0600
22:1 Erucic	< 0.0600	< 0.0600
20:3 11c,14c,17c Eicosatrienoic	< 0.0600	< 0.0600
20:3 11c,14c,17c Eicosatrienoic	< 0.0600	< 0.0600
20:4 Arachidonic	< 0.0600	< 0.0600
20:4 Arachidonic	< 0.0600	< 0.0600
20:5 5c,8c,11c,14c,17c Eicosapentaenoic (EPA)	< 0.0600	< 0.0600
20:5 5c,8c,11c,14c,17c Eicosapentaenoic (EPA)	< 0.0600	< 0.0600

**Table 3**  
**Compositional Analyses**  
**of Soybean RBD Oil**

<b>Sample Number</b>	RPN08024-018	RPN08024-022
<b>Material Name</b>	MON 87705	MON 87705
<b>Field Site</b>	IA	IA
<b>Replicate</b>	1	2
<b>Covance Number (Vitamin E)</b>	80600630	80600624
<b>Covance Number (Fatty Acids)</b>	80502776	80502777
<b>Fatty Acids (%)</b>		
24:0 Lignoceric	0.109	0.109
24:0 Lignoceric	0.111	0.108
24:1 Nervonic	< 0.0600	< 0.0600
24:1 Nervonic	< 0.0600	< 0.0600
22:5 7c,10c,13c,16c,19c Docosapentaenoic (DPA)	< 0.0600	< 0.0600
22:5 7c,10c,13c,16c,19c Docosapentaenoic (DPA)	< 0.0600	< 0.0600
22:6 4c,7c,10c,13c,16c,19c Docosahexaenoic (DHA)	< 0.0600	< 0.0600
22:6 4c,7c,10c,13c,16c,19c Docosahexaenoic (DHA)	< 0.0600	< 0.0600

**Table 4**  
**Compositional Analyses**  
**of Soybean Protein Isolate**

Sample Number	RPN08024-011	RPN08024-015	RPN08024-003
Material Name	A3525	A3525	A3525
Field Site	IL	IL	IA
Replicate	1	2	1
Covance LIMS Number	80600637	80600633	80600632
Moisture (%)	1.52	1.02	1.40
Moisture (%)	1.54	0.846	0.958
<b>Amino Acids (mg/g)</b>			
Aspartic Acid	106	109	105
Aspartic Acid	107	108	106
Threonine	33.2	32.1	34.2
Threonine	33.4	32.1	33.6
Serine	49.5	48.4	48.2
Serine	49.3	47.8	48.6
Glutamic Acid	171	179	169
Glutamic Acid	172	178	172
Proline	48.3	51.0	50.0
Proline	48.6	50.5	49.0
Glycine	38.4	38.7	38.8
Glycine	38.5	38.5	38.7
Alanine	36.9	36.2	37.2
Alanine	37.1	36.0	37.1
Cystine	12.2	11.6	11.4
Cystine	12.1	10.6	11.5
Valine	42.1	44.6	43.8
Valine	42.4	44.4	43.8
Methionine	12.8	11.9	12.1
Methionine	12.7	10.8	12.4
Isoleucine	42.8	44.9	43.7
Isoleucine	43.1	44.8	43.6
Leucine	71.6	72.6	72.4
Leucine	71.7	72.3	72.4
Tyrosine	33.9	34.0	34.1
Tyrosine	33.8	34.0	34.0
Phenylalanine	49.4	50.3	50.1
Phenylalanine	49.2	50.1	49.9
Lysine	56.6	57.2	56.7
Lysine	56.7	56.8	56.7
Histidine	23.2	23.5	23.8
Histidine	23.3	23.4	23.8
Arginine	75.4	78.0	76.6
Arginine	75.9	77.7	76.5
Tryptophan	10.3	9.53	10.5
Tryptophan	10.4	10.1	10.1

**Table 4**  
**Compositional Analyses**  
**of Soybean Protein Isolate**

Sample Number	RPN08024-007	RPN08024-027	RPN08024-031
Material Name	A3525	MON 87705	MON 87705
Field Site	IA	IL	IL
Replicate	2	1	2
Covance LIMS Number	80600634	80600636	80600638
Moisture (%)	1.63	1.71	1.69
Moisture (%)	1.75	1.76	1.64
<b>Amino Acids (mg/g)</b>			
Aspartic Acid	109	104	110
Aspartic Acid	108	104	110
Threonine	32.8	33.5	32.4
Threonine	33.0	33.4	32.1
Serine	48.1	47.6	50.0
Serine	48.1	48.1	49.6
Glutamic Acid	176	166	179
Glutamic Acid	177	166	178
Proline	50.8	48.1	50.1
Proline	50.8	48.3	50.4
Glycine	39.0	38.1	38.8
Glycine	39.1	37.9	38.7
Alanine	36.3	37.1	36.0
Alanine	36.4	36.3	36.0
Cystine	11.9	12.0	12.5
Cystine	11.8	12.1	12.6
Valine	45.2	43.0	42.5
Valine	44.9	42.6	42.8
Methionine	12.4	12.7	12.5
Methionine	12.5	12.7	12.5
Isoleucine	44.8	42.9	43.8
Isoleucine	44.9	42.6	44.1
Leucine	72.3	70.8	72.6
Leucine	72.9	70.5	72.1
Tyrosine	34.1	33.8	34.2
Tyrosine	34.3	33.6	33.5
Phenylalanine	50.4	48.6	50.9
Phenylalanine	50.6	48.4	50.4
Lysine	57.2	56.6	57.4
Lysine	57.1	56.5	57.1
Histidine	24.0	23.1	23.6
Histidine	24.0	23.1	23.5
Arginine	79.1	74.4	79.5
Arginine	78.9	74.3	79.5
Tryptophan	10.4	10.1	9.93
Tryptophan	10.6	10.2	9.88

**Table 4**  
**Compositional Analyses**  
**of Soybean Protein Isolate**

<b>Sample Number</b>	RPN08024-019	RPN08024-023
<b>Material Name</b>	MON 87705	MON 87705
<b>Field Site</b>	IA	IA
<b>Replicate</b>	1	2
<b>Covance LIMS Number</b>	80600639	80600635
Moisture (%)	1.27	2.99
Moisture (%)	1.32	2.93
<b>Amino Acids (mg/g)</b>		
Aspartic Acid	108	105
Aspartic Acid	108	105
Threonine	33.8	32.4
Threonine	33.9	32.8
Serine	49.5	47.0
Serine	49.7	47.6
Glutamic Acid	173	170
Glutamic Acid	173	170
Proline	50.0	48.1
Proline	50.2	48.9
Glycine	39.3	37.9
Glycine	39.3	38.1
Alanine	37.6	36.0
Alanine	37.6	36.2
Cystine	11.8	11.4
Cystine	11.5	11.4
Valine	44.4	43.6
Valine	44.2	43.6
Methionine	12.4	12.4
Methionine	12.3	12.3
Isoleucine	43.9	43.4
Isoleucine	43.8	43.5
Leucine	73.1	71.0
Leucine	73.2	71.5
Tyrosine	34.4	33.7
Tyrosine	34.5	33.6
Phenylalanine	50.5	48.4
Phenylalanine	50.0	49.0
Lysine	57.0	56.4
Lysine	57.2	56.8
Histidine	24.1	23.2
Histidine	24.1	23.4
Arginine	77.8	75.5
Arginine	78.0	76.0
Tryptophan	10.6	10.4
Tryptophan	10.6	10.3

**Table 5**  
**Compositional Analyses**  
**of Soybean Crude Lecithin**

<b>Sample Number</b>	RPN08024-012	RPN08024-016	RPN08024-004
<b>Material Name</b>	A3525	A3525	A3525
<b>Field Site</b>	IL	IL	IA
<b>Replicate</b>	1	2	1
<b>Covance LIMS Number</b>	80600641	80600645	80600642
<b>Phosphatides (%)</b>			
L-alpha-Phosphatidic Acid	1.45	1.64	< 0.70
L-alpha-Phosphatidic Acid	1.42	1.55	< 0.70
L-alpha-Phosphatidylethanolamine	4.12	6.72	4.91
L-alpha-Phosphatidylethanolamine	4.00	6.68	4.91
L-alpha-Phosphatidylcholine	5.87	9.00	8.25
L-alpha-Phosphatidylcholine	5.63	9.36	7.09
L-alpha-Phosphatidylinositol	4.14	5.95	4.82
L-alpha-Phosphatidylinositol	3.91	6.16	4.11



**Table 5**  
**Compositional Analyses**  
**of Soybean Crude Lecithin**

<b>Sample Number</b>	RPN08024-008	RPN08024-028	RPN08024-032
<b>Material Name</b>	A3525	MON 87705	MON 87705
<b>Field Site</b>	IA	IL	IL
<b>Replicate</b>	2	1	2
<b>Covance LIMS Number</b>	80600644	80600640	80600646
<b>Phosphatides (%)</b>			
L-alpha-Phosphatidic Acid	1.67	< 0.70	1.34
L-alpha-Phosphatidic Acid	1.50	< 0.70	1.37
L-alpha-Phosphatidylethanolamine	4.49	< 1.30	2.02
L-alpha-Phosphatidylethanolamine	4.11	< 1.30	2.14
L-alpha-Phosphatidylcholine	6.47	2.03	3.98
L-alpha-Phosphatidylcholine	5.78	1.83	4.06
L-alpha-Phosphatidylinositol	4.20	1.21	2.28
L-alpha-Phosphatidylinositol	3.78	1.06	2.36

**Table 5**  
**Compositional Analyses**  
**of Soybean Crude Lecithin**

<b>Sample Number</b>	RPN08024-020	RPN08024-024
<b>Material Name</b>	MON 87705	MON 87705
<b>Field Site</b>	IA	IA
<b>Replicate</b>	1	2
<b>Covance LIMS Number</b>	80600647	80600643
<b>Phosphatides (%)</b>		
L-alpha-Phosphatidic Acid	1.63	1.03
L-alpha-Phosphatidic Acid	1.64	1.09
L-alpha-Phosphatidylethanolamine	4.79	2.21
L-alpha-Phosphatidylethanolamine	4.79	2.32
L-alpha-Phosphatidylcholine	7.95	3.62
L-alpha-Phosphatidylcholine	7.75	3.82
L-alpha-Phosphatidylinositol	4.58	1.05
L-alpha-Phosphatidylinositol	4.48	1.20

## **APPENDIX A**

## Analytical Method Summaries and Reference Standards

### 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 quantitation for this study was 0.100%.

#### Reference:

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

### Amino Acid Composition (TAA5)

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 quantitation for each amino acid in this study was 0.100 mg/g.

#### Reference Standards:

Thermo Scientific/Pierce, K18, 2.5  $\mu\text{mol/mL}$  per constituent (except cystine 1.25  $\mu\text{mol/mL}$ ), Lot Number IJ115731

Sigma, L-Tryptophan, 100%, Lot Number 076K0075

Sigma/BioChemica, L-Cysteic Acid Monohydrate, >99.9% (used as 100%), Lot Number 1035674

Sigma, L-Methionine Sulfone, >99% (used as 100%), Lot Number 012H3349

#### Reference:

*Official Methods of Analysis of AOAC INTERNATIONAL*, 18th Ed., Method 982.30, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2005).

### 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 quantitation for this study was 0.100%.

#### Reference:

*Official Methods of Analysis of AOAC INTERNATIONAL*, 18th Ed., Method 923.03, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2005).

### **Carbohydrates (CHO)**

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

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

The limit of quantitation for this study was 0.100%.

#### **Reference:**

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

### **Fat by Soxhlet Extraction (FSOX)**

The sample was weighed into a cellulose thimble containing 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 quantitation for this study was 0.100%.

#### **Reference:**

*Official Methods of Analysis of AOAC INTERNATIONAL*, 18th Ed., Method 960.39, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2005).

### **Fatty Acid Profile with Trans Fat by GC (FALT)**

The lipid was extracted, saponified with 0.5N methanolic sodium hydroxide, and methylated with 14% BF<sub>3</sub>-methanol. The resulting methyl esters of the fatty acids were extracted with heptane. An internal standard was added prior to the lipid extraction. The methyl esters of the fatty acids were analyzed by gas chromatography using external standards for quantitation. The limit of quantitation was 0.0200%-0.0600% depending on the matrix.

#### **Reference Standards:**

Nu Chek Prep GLC Reference Standard Hazelton No. 1, Lot Number JY19-R, 100%\*

Nu Chek Prep GLC Reference Standard Hazelton No. 2, Lot Number M13-O, 100%\*

Nu Chek Prep GLC Reference Standard Hazelton No. 3, Lot Number MA18-S, 100%\*

Nu Chek Prep GLC Reference Standard Hazelton No. 4, Lot Number JY19-R, 100%\*

Nu Chek Prep Methyl Gamma Linolenate, used as 100%

Lot Number U-63M-JY12-R

Nu Chek Prep Methyl Tridecanoate, used as 100%, Lot Number N-13M-F5-S

Nu Chek Prep Methyl Butyrate, used as 100%, Lot Number N-4M-J20-R

Nu Chek Prep Methyl Hexanoate, used as 100%, Lot Number N-6M-A25-R

Nu Chek Prep Methyl Erucate, used as 100%, Lot Number U-79M-AU3-Q

Nu Chek Prep Methyl Lignocerate, used as 100%, Lot Number N-24M-F5-S

\* Overall purity of the sum of the mixture components

Nu Chek Prep Methyl Docosapentaenoate, used as 100%, Lot Number U-101M-F18-S  
Nu Chek Prep Methyl Docosaheptaenoate, used as 100%,  
Lot Number U-84M-D24-R  
Nu Chek Prep Methyl Eicosapentaenoate, used as 100%, Lot Number U-99M-D14-R  
Cayman Chemicals Stearidonic Acid Methyl Ester, used as 100%,  
Lot Number 186208-192001 and 186208-192002  
Nu Chek Prep Methyl Elaidate, used as 100%, Lot Number U-47M-JA18-R  
Nu Chek Prep Methyl Linoelaidate, used as 100%, Lot Number U-60M-F27-R  
Nu Chek Prep Methyl Nervonate, used as 100%, Lot Number U-88M-O19-R  
Nu Chek Prep Methyl Palmitelaidate, used as as 100%, Lot Number U-41M-O26-R  
Monsanto Mono Trans SDA, 99%, Lot Number GLP-0804-19309-A  
Monsanto Alpha Linolenic Acid, used as 100%, Lot Number GLP-0804-19308-A  
Monsanto 9c, 15c Octadecadienoate (Omnisoy), used as 100%,  
Lot Number GLP-0802-19168-A  
Larodan Methyl 6(z), 9(z)-Octadecadienoate, used as 99.6%, Lot Number LS-113

Reference:

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

**Isoflavones Analysis (ISOF)**

The sample was extracted using a solution of hydrochloric acid and reagent alcohol heated on steam baths or hot plates. The extract was brought to volume, diluted, and centrifuged. An aliquot of the supernatant was placed onto a C18 solid-phase extraction column. Unwanted components of the matrix were rinsed off with 20% methanol and then the isoflavones were eluted with 80% methanol. The sample was analyzed on a high-performance liquid chromatography system with ultraviolet spectrophotometric quantitation and was compared against an external standard curve of known standards. The limit of quantitation for each component was 10.0 µg/g.

Reference Standards:

Indofine, Daidzein, 99% , Lot Number 020508146  
Indofine, Genistein, ≥99% (used as 100% in calculations), Lot Number 0309074  
Indofine, Glycitein, 99%, Lot Number 0704034

References:

Seo, A. and Morr, C. V., "Improved High-Performance Liquid Chromatographic Analysis of Phenolic Acids and Isoflavonoids from Soybean Protein Products," *Journal of Agricultural and Food Chemistry*, 32(3): 530-533, (1984).

Pettersson, H., and Kiessling, K.-H., "Liquid Chromatographic Determination of the Plant Estrogens Coumestrol and Isoflavones in Animal Feed," *Association of Official Analytical Chemists Journal*, 67(3): 503-506, (1984).

### **Lectin (LECT)**

The sample was suspended in phosphate buffered saline (PBS), shaken, and filtered. An aliquot of the resulting extract was serially diluted in 10 cuvettes containing PBS. A 10% hematocrit of lyophilized rabbit blood in PBS was added to each dilution. After 2.5 hours, the absorbance of each dilution of the sample and lectin control was read by a spectrophotometer at 620 nm, using PBS to zero the instrument. One hemagglutinating unit (H.U.) was defined as the level that caused 50% of the standard cell suspension to sediment in 2.5 hours. The limit of quantitation for this study was 0.10 H.U./mg.

Klurfeld, D. M. and Kritchevsky, D., "Isolation and Quantitation of Lectins from Vegetable Oils," *Lipids*, 22:667-668, (1987).

Klurfeld, D. M., Personal communication. Liener, I. E., "The Photometric Determination of the Hemagglutinating Activity of Soyin and Crude Soybean Extracts," *Archives of Biochemistry and Biophysics*, 54:223-231, (1955).

### **Moisture (M100)**

The sample was dried in a vacuum oven at approximately 100°C to a constant weight. The moisture weight loss was determined and converted to percent moisture. The limit of quantitation for this study was 0.100%.

#### **Reference:**

*Official Methods of Analysis of AOAC INTERNATIONAL*, 18th Ed., Methods 926.08 and 925.09, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2005).

### **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 quantitation for this study was 0.100%.

#### **References:**

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

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

### **Phytic Acid (PHYT)**

The sample was extracted using 0.5M HCl with ultrasonication. Purification and concentration was done on a silica based anion exchange (SAX) column. Sample analysis was done on a polymer HPLC column PRP-1, 5µm (150 x 4.1mm) and a refractive index detector. The limit of quantitation for this study was 0.100%.

Reference Standard:

Sigma-Aldrich, Phytic Acid Dodecasodium Salt Hydrate, 95%,  
Lot Number 077K0693

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).

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).

**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 quantitation for this study was 0.100%.

References:

*Official Methods of Analysis of AOAC INTERNATIONAL*, 18th Ed., Methods 955.04 and 979.09, AOAC INTERNATIONAL: Gaithersburg, Maryland, (2005).

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

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

**Phosphatides (LPLC)**

The sample was extracted with a 98% CHCl<sub>3</sub> 2% MeOH solvent. The extract is then analyzed on an HPLC system equipped with an evaporative light-scattering detector (ELSD). A calibration curve is used for quantification. The Limits of Quantitation for these assays were as follows: L-alpha-Phosphatidic Acid 0.70%, L-alpha-Phosphatidylcholine 1.30%, L-alpha-Phosphatidylethanolamine 1.30%, and L-alpha-Phosphatidylinositol 0.70%.

Reference Standards:

(PA) – Avanti Polar Lipids, L-alpha-Phosphatidic Acid (sodium salt), 100%,  
Lot Numbers SPA-19 and SPA-20.

(PC) – Avanti Polar Lipids, L-alpha-Phosphatidylcholine, 100%,  
Lot Numbers PPC-116f and PPC-117

(PE) – Avanti Polar Lipids, L-alpha-Phosphatidylethanolamine, 100%,  
Lot Numbers PPE-133 and PPE-133c.



(PI) – Avanti Polar Lipids, L-alpha-Phosphatidylinositol (Sodium salt), 100%,  
Lot Numbers PPI-151 and PPI-154.

References:

AOCS Official Method Ja 7b-91, Determination of Lecithin Phospholipids by  
HPLC, 1997.

**Raffinose and Stachyose (SUGT)**

The sample was extracted with deionized water and the extract treated with a hydroxylamine hydrochloride solution in pyridine, containing phenyl- $\beta$ -D-glucoside as an internal standard. The resulting oximes were converted to silyl derivatives by treatment with hexamethyldisilazane and trifluoroacetic acid and analyzed by gas chromatography using a flame ionization detector. The limit of quantitation for this study was 0.0500%.

Reference Standards:

Sigma, Raffinose Pentahydrate, 99% / 84.0% after correction for degree of hydration,  
Lot Number 035K1371

Sigma, Stachyose, 98% / 96.4% after correction for degree of hydration,  
Lot Number 065K3775

References:

Mason, B. S., and Slover, H. T., "A Gas Chromatographic Method for the  
Determination of Sugars in Foods," *Journal of Agricultural and Food Chemistry*,  
19(3):551-554, (1971).

Brobst, K. M., "Gas-Liquid Chromatography of Trimethylsilyl Derivatives," *Methods  
in Carbohydrate Chemistry*, Volume 6, Academic Press: New York, New York,  
(1972).

**Trypsin Inhibitor (TRIP)**

The sample was ground and defatted with petroleum ether. A sample of matrix was extracted for 3 hours with 0.01N sodium hydroxide. Varying aliquots of the sample suspension were exposed to a known amount of trypsin and benzoyl-DL-arginine-p-nitroanalide hydrochloride. The sample was allowed to react for 10 minutes at 37°C. After 10 minutes, the reaction was halted by the addition of acetic acid. The solution was centrifuged, then the absorbance was determined at 410 nm. Trypsin inhibitor activity was determined by photometrically measuring the inhibition of trypsin's reaction with benzoyl-DL-arginine-p-nitroanalide hydrochloride. The limit of quantitation for this study was 1.00 Trypsin Inhibitor Units (TIU)/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).

**Vitamin E (LCAT)**

The sample 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 quantitation for this study was 0.500 mg/100g.

Reference Standard:

USP, Alpha Tocopherol, 100%, Lot Number M

References:

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).

Speek, A. J., Schijver, J., and Schreurs, W. H. P., "Vitamin E Composition of Some Seed Oils as Determined by High-Performance Liquid Chromatography with Fluorometric Quantitation," *Journal of Food Science*, 50(1):121-124, (1985).

McMurray, C. H., Blanchflower, W. J., and Rice, D. A., "Influence of Extraction Techniques on Determination of alpha-Tocopherol in Animal Feedstuffs," *Journal of the Association of Official Analytical Chemists*, 63(6):1258-1261, (1980).

## **APPENDIX B**

### Fatty Acid Nomenclature

Carbon #	Trivial	Systematic	Double bond location(s)	Comment	IS
8:0	Caprylic	Octanoic acid	-		√
10:0	Capric	Decanoic acid	-		√
12:0	Lauric	Dodecanoic acid	-		√
14:0	Myristic	Tetradecanoic acid	-		√
14:1	Myristoleic	Tetradecenoic acid	9c		√
15:0	Pentadecylic	Pentadecanoic acid	-		√
15:1	-	Pentadecenoic acid	10c		√
16:0	Palmitic	Hexadecanoic acid	-		√
16:1	Palmitelaidic	Hexadecenoic acid	9t		√
16:1	Palmitoleic	Hexadecenoic acid	9c		√
17:0	Margaric	Heptadecanoic acid	-		√
17:1	Heptadecylenic	Heptadecenoic acid	9c		a
18:0	Stearic	Octadecanoic acid	-		√
18:1	Elaidic	Octadecenoic acid	9t	b	√
18:1	Oleic	Octadecenoic acid	9c	c	√
18:2	Linoleic	Octadecadienoic acid	9c,12c		√
18:2	-	Octadecadienoic acid	6c,9c		√
18:2	-	Octadecadienoic acid	9c,15c		√
18:2	Linolelaidic	Octadecadienoic acid	9t,12t	d	√
18:3	Linolenic	Octadecatrienoic acid	9c,12c,15c		√
18:3	Gamma Linolenic	Octadecatrienoic acid	6c,9c,12c		√
18:3	-	Octadecatrienoic acid	9c,12c,15t		√
18:3	Other 18:3 trans	Octadecatrienoic acid	e		e
18:4	Stearidonic (SDA)	Octadecatetraenoic acid	6c,9c,12c,15c		√
18:4	-	Octadecatetraenoic acid	6c,9c,12c,15t		√
20:0	Arachidic	Eicosanoic acid	-		√
20:1	Gondoic	Eicosenoic acid	11c		√
20:2	-	Eicosadienoic acid	11c,14c		√
20:3	-	Eicosatrienoic acid	11c,14c,17c		√
20:4	Arachidonic	Eicosatetraenoic acid	5c,8c,11c,14c		√
20:5	-	Eicosapentaenoic acid (EPA)	5c,8c,11c,14c,17c		√
22:0	Behenic	Docosanoic acid	-		√
22:1	Erucic	Docosenoic acid	13c		√
22:5	-	Docosapentaenoic acid (DPA)	7c,10c,13c,16c,19c		√
22:6	-	Docosahexaenoic acid (DHA)	4c,7c,10c,13c,16c,19c		√
24:0	Lignoceric	Tetracosanoic acid	-		√
24:1	Nervonic	Tetracosenoic acid	15c		√

IS – in-method quantitation standard

a – 10c Heptadecenoic acid used as quantitation standard.

b – Reported results include all 18:1 trans isomers quantitated from elaidic.

c – Reported results include all 18:1 cis isomers quantitated from oleic.

d – Reported results include all 18:2 trans isomers quantitated from linolelaidic.

e – Reported results include all 18:3 trans isomers quantitated from linolenic except 9c,12c,15t octadecatrienoic acid, which is reported as a separate peak.

## **Appendix 2. Certus International, Inc. Statistical Sub-Report**

### **Composition Analyses of Soybean Seed, Meal, Oil, Protein Isolate, and Lecithin Derived from MON 87705 Produced in the United States during the 2007 Field Season**

The following 28 pages are the statistical sub-report  
Pages 94 — 121

Amended

## STATISTICAL REPORT


**Composition Analyses of Soybean Seed, Meal, Oil, Protein Isolate,  
and Lecithin Derived from MON 87705 Produced in the United States  
during the 2007 Field Season**

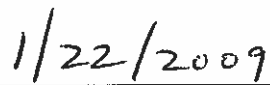
STUDY NUMBER: REG-08-144

SPONSOR: Monsanto Company  
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Date

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## 1. Data Description

A SAS<sup>®</sup> dataset (finaldata749.sas7bdat, created 10/6/2008) containing soybean seed and meal, RBD oil, protein isolate, and lecithin fraction compositional analysis data was received from Monsanto. Data were from test substance MON 87705 and conventional control substance A3525.

Soybean seed of the test and control were collected during 2007 from four replication blocks; two plots at each of two U.S. sites. Compositional analyses were performed on each processed sample in duplicate.

Components with greater than fifty percent of observations below the assay's limit of quantitation (LOQ) were excluded from analysis. Excluded components are presented in Listing 1. Otherwise, results below the LOQ were assigned a value equal to half the LOQ. The following components were assigned values:

		Obs. Below LOQ				
Component	Units	N	(%)	Total N	LOQ	Value Assigned
<b>Seed Fatty Acid</b>						
24:0 Lignoceric	% FW	8	50.0	16	0.020	0.010
<b>Meal Antinutrient</b>						
Trypsin Inhibitor	TIU/mg FW	5	31.3	16	1.00	0.50
<b>RBD Oil Fatty Acid</b>						
14:0 Myristic	% FW	8	50.0	16	0.060	0.030
17:0 Margaric	% FW	7	43.8	16	0.060	0.030
17:1 9c Heptadecenoic	% FW	8	50.0	16	0.060	0.030
<b>Lecithin Phosphatide</b>						
L-alpha-Phosphatidic Acid	% FW	4	25.0	16	0.70	0.35
L-alpha-Phosphatidylethanolamine	% FW	2	12.5	16	1.30	0.65

Individual samples assigned a value are presented in Listing 2.

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

Component	From (X)	To	Formula <sup>1</sup>
Proximates (excluding Moisture), Fiber, Phytic Acid, Raffinose, Stachyose	% FW	% DW	X/d
Isoflavones	µg/g FW	µg/g DW	X/d
Trypsin Inhibitor	TIU/mg FW	TIU/mg DW	X/d
Seed Vitamin E	mg/100g FW	mg/100g DW	X/d
Amino Acids (AA)	mg/g FW	% DW	X/(10d)

<sup>®</sup> SAS is a registered trademark of SAS Institute Inc.

(cont.)

Component	From (X)	To	Formula <sup>1</sup>
Fatty Acids (FA)	% FW	% Total FA	$(100)X_i/\Sigma X$
<sup>1</sup> 'X' is the individual sample value; 'd' is the fraction of the sample that is dry matter; 'X <sub>j</sub> ' is an individual fatty acid value from a sample and 'ΣX' is the sum of all fatty acids from the sample.			

## 2. Statistical Methods

This study was designed to estimate the levels of compositional components in the test and control seed and processed fractions for the purpose of evaluating compositional equivalence. All statistical analyses were performed on the average of compositional analysis duplicates re-expressed as appropriate.

The SAS<sup>1</sup> GLM procedure was applied to all data (test and control) to detect potential outliers in the dataset by screening studentized PRESS residuals. Substance and site effects were included in the model.

A PRESS residual<sup>2</sup> is the difference between any value and its predicted value from a statistical model that excludes the data point. The studentized version scales these residuals so that the values tend to have a standard normal distribution when outliers are absent. Thus, most values are expected to be between  $\pm 3$ . Extreme data points that are also outside of the  $\pm 6$  studentized PRESS residual range are considered for exclusion, as outliers, from the final analyses. The following results had PRESS residual values outside of the  $\pm 6$  studentized PRESS residual range:

Site ID	Description	Analyte	Sample ID	Value	PRESS Std Residual
<b>Protein Isolate Amino Acid (% DW)</b>					
IL	A3525	Methionine	RPN08024-015	1.1457	-6.9899
<b>Seed Antinutrient (H.U./mg FW)</b>					
IL	A3525	Lectin	07018319-00010	2.2500	6.0055

Given the small sample size of this study, it was decided that there was insufficient evidence to remove any of the identified values as outliers.

All soybean compositional analysis components were statistically analyzed using a mixed model analysis of variance. Combined site analyses used model (1).

$$(1) Y_{ij} = U + T_i + B_j + e_{ij},$$

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

### **3. Statistical Results**

SAS 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.

Statistical results for each soybean seed and processed fraction component are summarized for MON 87705 vs. the control in Tables 1 through 5. For each component, least-square means, standard errors (S.E.), and the range of observed values are presented for each substance. Mean differences, standard errors of the differences, 95% confidence intervals for the mean differences and the significance probability are presented for each comparison.

Of 111 comparisons for MON 87705 vs. the control, 31 were statistically significant ( $p < 0.05$ ). Components with a statistically significant comparison are further summarized in Table 6.

### **4. References**

1. SAS Software Release 9.1 (TS1M3). Copyright (c) 2002-2003 by SAS Institute Inc., Cary, NC, USA.
2. Belsley, D. A., Kuh, E., Welsch, R. E. 1980. Regression Diagnostics: Identifying Influential Data and Sources of Collinearity. John Wiley & Sons, New York.

**TABLE 1. Statistical Summary of Combined Site Soybean Seed Fraction Amino Acid, Fatty Acid, Fiber, Proximate, Vitamin E, Antinutrient and Isoflavone Content for Test (MON 87705) vs. the Conventional Control (A3525)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
Amino Acid (% DW)					
Alanine (% DW)	1.76 (0.024) [1.73 - 1.80]	1.76 (0.024) [1.67 - 1.81]	0.0062 (0.021)	-0.060, 0.072	0.783
Arginine (% DW)	3.33 (0.093) [3.16 - 3.56]	3.25 (0.093) [3.00 - 3.44]	0.085 (0.091)	-0.21, 0.38	0.419
Aspartic Acid (% DW)	4.66 (0.085) [4.51 - 4.91]	4.60 (0.085) [4.39 - 4.75]	0.055 (0.064)	-0.15, 0.26	0.448
Cystine (% DW)	0.60 (0.0092) [0.58 - 0.62]	0.59 (0.0092) [0.58 - 0.61]	0.0042 (0.010)	-0.028, 0.036	0.706
Glutamic Acid (% DW)	7.45 (0.15) [7.19 - 7.79]	7.42 (0.15) [6.96 - 7.71]	0.035 (0.10)	-0.29, 0.36	0.754
Glycine (% DW)	1.80 (0.022) [1.76 - 1.86]	1.79 (0.022) [1.73 - 1.83]	0.0091 (0.017)	-0.044, 0.062	0.625
Histidine (% DW)	1.09 (0.020) [1.07 - 1.14]	1.08 (0.020) [1.03 - 1.14]	0.0080 (0.012)	-0.032, 0.048	0.565
Isoleucine (% DW)	1.88 (0.029) [1.83 - 1.92]	1.90 (0.029) [1.80 - 1.96]	-0.018 (0.018)	-0.076, 0.041	0.400
Leucine (% DW)	3.11 (0.050) [3.02 - 3.22]	3.10 (0.050) [2.94 - 3.18]	0.0089 (0.036)	-0.11, 0.12	0.822

**TABLE 1. Statistical Summary of Combined Site Soybean Seed Fraction Amino Acid, Fatty Acid, Fiber, Proximate, Vitamin E, Antinutrient and Isoflavone Content for Test (MON 87705) vs. the Conventional Control (A3525) (cont.)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
<b>Amino Acid (% DW)</b>					
Lysine (% DW)	2.65 (0.034) [2.60 - 2.71]	2.62 (0.034) [2.50 - 2.68]	0.026 (0.031)	-0.073, 0.12	0.468
Methionine (% DW)	0.56 (0.0054) [0.55 - 0.57]	0.56 (0.0054) [0.54 - 0.57]	0.0052 (0.0076)	-0.013, 0.024	0.520
Phenylalanine (% DW)	2.10 (0.038) [2.04 - 2.20]	2.09 (0.038) [1.98 - 2.17]	0.0083 (0.024)	-0.068, 0.085	0.754
Proline (% DW)	1.97 (0.041) [1.88 - 2.12]	1.97 (0.041) [1.93 - 2.03]	-0.0014 (0.039)	-0.13, 0.12	0.973
Serine (% DW)	2.06 (0.041) [2.00 - 2.18]	2.04 (0.041) [1.96 - 2.12]	0.019 (0.042)	-0.12, 0.15	0.683
Threonine (% DW)	1.55 (0.026) [1.50 - 1.65]	1.51 (0.026) [1.47 - 1.55]	0.040 (0.035)	-0.072, 0.15	0.339
Tryptophan (% DW)	0.48 (0.0036) [0.47 - 0.50]	0.47 (0.0036) [0.47 - 0.47]	0.011 (0.0048)	-0.0038, 0.027	0.096
Tyrosine (% DW)	1.41 (0.033) [1.35 - 1.49]	1.36 (0.033) [1.29 - 1.42]	0.053 (0.044)	-0.086, 0.19	0.312
Valine (% DW)	2.00 (0.034) [1.93 - 2.04]	2.01 (0.034) [1.89 - 2.07]	-0.014 (0.020)	-0.078, 0.051	0.551

**TABLE 1. Statistical Summary of Combined Site Soybean Seed Fraction Amino Acid, Fatty Acid, Fiber, Proximate, Vitamin E, Antinutrient and Isoflavone Content for Test (MON 87705) vs. the Conventional Control (A3525) (cont.)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
<b>Fatty Acid (% Total FA)</b>					
16:0 Palmitic (% Total FA)	2.47 (0.072) [2.34 - 2.56]	11.58 (0.072) [11.40 - 11.81]	-9.11 (0.070)	-9.33, -8.89	<0.001
18:0 Stearic (% Total FA)	3.26 (0.090) [2.95 - 3.51]	4.45 (0.090) [4.31 - 4.54]	-1.19 (0.085)	-1.46, -0.92	<0.001
18:1 Oleic (% Total FA)	73.05 (0.80) [71.09 - 74.62]	23.45 (0.80) [21.60 - 25.62]	49.60 (1.12)	46.84, 52.35	<0.001
18:2 Linoleic (% Total FA)	13.51 (0.84) [11.39 - 15.93]	52.33 (0.84) [51.38 - 53.33]	-38.82 (1.18)	-41.72, -35.92	<0.001
18:3 Linolenic (% Total FA)	6.69 (0.51) [5.85 - 7.52]	7.21 (0.51) [5.98 - 8.58]	-0.52 (0.30)	-1.46, 0.43	0.181
20:0 Arachidic (% Total FA)	0.28 (0.0099) [0.26 - 0.31]	0.34 (0.0099) [0.33 - 0.37]	-0.063 (0.0060)	-0.082, -0.044	0.001
20:1 Eicosenoic (% Total FA)	0.32 (0.016) [0.29 - 0.37]	0.19 (0.016) [0.16 - 0.21]	0.14 (0.0078)	0.11, 0.16	<0.001
22:0 Behenic (% Total FA)	0.30 (0.011) [0.29 - 0.34]	0.33 (0.011) [0.31 - 0.35]	-0.026 (0.0076)	-0.050, -0.0017	0.042
24:0 Lignoceric (% Total FA)	0.12 (0.031) [0.072 - 0.18]	0.13 (0.031) [0.068 - 0.19]	-0.0037 (0.0049)	-0.019, 0.012	0.502

**TABLE 1. Statistical Summary of Combined Site Soybean Seed Fraction Amino Acid, Fatty Acid, Fiber, Proximate, Vitamin E, Antinutrient and Isoflavone Content for Test (MON 87705) vs. the Conventional Control (A3525) (cont.)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
<b>Fiber</b>					
Acid Detergent Fiber (% DW)	16.27 (0.53) [15.75 - 17.26]	16.80 (0.53) [15.60 - 18.48]	-0.53 (0.47)	-2.03, 0.97	0.339
Neutral Detergent Fiber (% DW)	16.80 (0.37) [16.17 - 17.80]	18.51 (0.37) [17.60 - 19.28]	-1.71 (0.52)	-2.98, -0.45	0.016
<b>Proximate</b>					
Ash (% DW)	4.98 (0.057) [4.89 - 5.11]	5.10 (0.057) [5.02 - 5.30]	-0.12 (0.080)	-0.37, 0.13	0.229
Carbohydrates (% DW)	36.74 (0.69) [34.60 - 38.11]	36.50 (0.69) [35.09 - 38.10]	0.24 (0.54)	-1.49, 1.97	0.688
Moisture (% FW)	8.10 (0.18) [7.87 - 8.41]	7.91 (0.18) [7.46 - 8.51]	0.19 (0.18)	-0.37, 0.76	0.359
Protein (% DW)	41.51 (0.64) [39.72 - 43.29]	41.09 (0.64) [39.93 - 42.02]	0.42 (0.53)	-1.27, 2.12	0.484
Total Fat (% DW)	16.80 (0.56) [15.74 - 18.40]	17.32 (0.56) [16.47 - 18.59]	-0.52 (0.14)	-0.98, -0.062	0.036
<b>Vitamin</b>					
Vitamin E (mg/100g DW)	2.94 (0.80) [1.66 - 4.62]	3.41 (0.80) [1.78 - 5.18]	-0.47 (0.16)	-0.96, 0.029	0.057
<b>Antinutrient</b>					
Lectin (H.U./mg FW)	1.15 (0.26) [0.88 - 1.44]	1.27 (0.26) [0.73 - 2.25]	-0.12 (0.32)	-1.15, 0.91	0.740

**TABLE 1. Statistical Summary of Combined Site Soybean Seed Fraction Amino Acid, Fatty Acid, Fiber, Proximate, Vitamin E, Antinutrient and Isoflavone Content for Test (MON 87705) vs. the Conventional Control (A3525) (cont.)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
<b>Antinutrient</b>					
Phytic Acid (% DW)	1.16 (0.071) [1.03 - 1.23]	1.24 (0.071) [0.98 - 1.37]	-0.085 (0.046)	-0.23, 0.062	0.163
Raffinose (% DW)	0.54 (0.086) [0.38 - 0.72]	0.55 (0.086) [0.39 - 0.72]	-0.010 (0.0084)	-0.037, 0.017	0.316
Stachyose (% DW)	3.71 (0.080) [3.55 - 3.99]	3.43 (0.080) [3.31 - 3.51]	0.28 (0.080)	0.028, 0.54	0.038
Trypsin Inhibitor (TIU/mg DW)	28.92 (2.26) [24.56 - 34.51]	28.73 (2.26) [23.10 - 34.09]	0.19 (2.13)	-6.57, 6.96	0.933
<b>Isoflavone</b>					
Daidzein (µg/g DW)	1156.66 (217.27) [601.88 - 1517.55]	939.81 (217.27) [428.85 - 1364.28]	216.85 (34.46)	107.18, 326.51	0.008
Genistein (µg/g DW)	760.48 (100.88) [485.09 - 929.09]	642.91 (100.88) [376.87 - 821.83]	117.57 (5.72)	99.36, 135.79	<0.001
Glycitein (µg/g DW)	82.81 (15.33) [44.16 - 109.01]	73.46 (15.33) [34.38 - 108.98]	9.35 (4.71)	-5.63, 24.32	0.141

<sup>1</sup>DW = dry weight; FW = fresh weight; FA = fatty acid; S.E. = standard error; CI = Confidence Interval.



**TABLE 2. Statistical Summary of Combined Site Soybean Meal Fraction Amino Acid, Fiber, Proximate and Antinutrient Content for Test (MON 87705) vs. the Conventional Control (A3525)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
Amino Acid (% DW)					
Alanine (% DW)	2.26 (0.021) [2.22 - 2.29]	2.33 (0.021) [2.26 - 2.38]	-0.071 (0.016)	-0.12, -0.022	0.019
Arginine (% DW)	4.22 (0.074) [4.01 - 4.37]	4.31 (0.074) [4.17 - 4.49]	-0.091 (0.075)	-0.33, 0.15	0.312
Aspartic Acid (% DW)	5.95 (0.068) [5.83 - 6.14]	6.16 (0.068) [5.99 - 6.32]	-0.21 (0.066)	-0.42, 0.0058	0.053
Cystine (% DW)	0.82 (0.028) [0.75 - 0.90]	0.81 (0.028) [0.78 - 0.87]	0.0016 (0.019)	-0.059, 0.062	0.938
Glutamic Acid (% DW)	9.43 (0.11) [9.17 - 9.70]	9.78 (0.11) [9.48 - 9.98]	-0.35 (0.14)	-0.79, 0.091	0.086
Glycine (% DW)	2.28 (0.018) [2.26 - 2.33]	2.34 (0.018) [2.29 - 2.38]	-0.057 (0.013)	-0.099, -0.015	0.023
Histidine (% DW)	1.40 (0.019) [1.38 - 1.43]	1.44 (0.019) [1.39 - 1.50]	-0.041 (0.016)	-0.093, 0.012	0.089
Isoleucine (% DW)	2.45 (0.021) [2.40 - 2.51]	2.53 (0.021) [2.50 - 2.58]	-0.080 (0.012)	-0.12, -0.043	0.006
Leucine (% DW)	4.02 (0.038) [3.94 - 4.13]	4.14 (0.038) [4.04 - 4.22]	-0.11 (0.038)	-0.23, 0.0060	0.056

**TABLE 2. Statistical Summary of Combined Site Soybean Meal Fraction Amino Acid, Fiber, Proximate and Antinutrient Content for Test (MON 87705) vs. the Conventional Control (A3525) (cont.)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
Amino Acid (% DW)					
Lysine (% DW)	3.25 (0.019) [3.22 - 3.29]	3.34 (0.019) [3.28 - 3.39]	-0.083 (0.022)	-0.15, -0.015	0.030
Methionine (% DW)	0.82 (0.024) [0.76 - 0.89]	0.84 (0.024) [0.79 - 0.89]	-0.021 (0.025)	-0.10, 0.057	0.452
Phenylalanine (% DW)	2.70 (0.030) [2.65 - 2.78]	2.79 (0.030) [2.71 - 2.86]	-0.093 (0.032)	-0.19, 0.0074	0.060
Proline (% DW)	2.65 (0.040) [2.60 - 2.76]	2.76 (0.040) [2.65 - 2.85]	-0.11 (0.037)	-0.23, 0.0099	0.061
Serine (% DW)	2.64 (0.037) [2.58 - 2.69]	2.73 (0.037) [2.61 - 2.81]	-0.093 (0.050)	-0.25, 0.065	0.157
Threonine (% DW)	2.06 (0.027) [1.99 - 2.09]	2.13 (0.027) [2.05 - 2.18]	-0.070 (0.031)	-0.17, 0.028	0.106
Tryptophan (% DW)	0.60 (0.013) [0.57 - 0.62]	0.60 (0.013) [0.57 - 0.64]	-0.0030 (0.013)	-0.045, 0.039	0.835
Tyrosine (% DW)	1.83 (0.023) [1.78 - 1.85]	1.85 (0.023) [1.80 - 1.91]	-0.027 (0.021)	-0.093, 0.039	0.279
Valine (% DW)	2.55 (0.020) [2.51 - 2.60]	2.64 (0.020) [2.61 - 2.69]	-0.092 (0.010)	-0.13, -0.058	0.003

**TABLE 2. Statistical Summary of Combined Site Soybean Meal Fraction Amino Acid, Fiber, Proximate and Antinutrient Content for Test (MON 87705) vs. the Conventional Control (A3525) (cont.)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
<b>Fiber</b>					
Acid Detergent Fiber (% DW)	6.54 (0.26) [5.96 - 6.89]	5.94 (0.26) [5.34 - 6.70]	0.59 (0.37)	-0.30, 1.49	0.156
Neutral Detergent Fiber (% DW)	8.55 (0.26) [8.05 - 8.96]	6.81 (0.26) [6.26 - 7.50]	1.74 (0.36)	0.59, 2.88	0.016
<b>Proximate</b>					
Ash (% DW)	6.99 (0.17) [6.74 - 7.30]	7.29 (0.17) [6.88 - 7.76]	-0.29 (0.097)	-0.60, 0.014	0.056
Carbohydrates (% DW)	39.31 (0.71) [37.73 - 40.04]	37.69 (0.71) [35.68 - 39.61]	1.62 (0.59)	-0.25, 3.49	0.070
Moisture (% FW)	3.33 (1.41) [2.72 - 3.91]	6.86 (1.41) [3.94 - 12.50]	-3.53 (2.00)	-8.41, 1.35	0.127
Protein (% DW)	52.91 (0.59) [52.01 - 54.17]	54.16 (0.59) [52.52 - 55.85]	-1.24 (0.63)	-3.24, 0.76	0.142
Total Fat (% DW)	0.78 (0.084) [0.61 - 1.04]	0.86 (0.084) [0.69 - 1.00]	-0.079 (0.10)	-0.41, 0.25	0.495
<b>Antinutrient</b>					
Phytic Acid (% DW)	1.37 (0.033) [1.27 - 1.43]	1.47 (0.033) [1.44 - 1.54]	-0.10 (0.033)	-0.21, 0.0047	0.055
Trypsin Inhibitor (TIU/mg DW)	2.15 (0.59) [0.52 - 4.09]	1.41 (0.59) [0.54 - 2.07]	0.74 (0.83)	-1.29, 2.77	0.405

<sup>1</sup>DW = dry weight; FW = fresh weight; S.E. = standard error; CI = Confidence Interval.

**TABLE 3. Statistical Summary of Combined Site Soybean RBD Oil Fraction Fatty Acid and Vitamin E Content for Test (MON 87705) vs. the Conventional Control (A3525)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
<b>Fatty Acid (% Total FA)</b>					
14:0 Myristic (% Total FA)	0.031 (0.0017) [0.031 - 0.032]	0.090 (0.0017) [0.086 - 0.097]	-0.059 (0.0025)	-0.065, -0.053	<0.001
16:0 Palmitic (% Total FA)	2.49 (0.087) [2.36 - 2.69]	11.59 (0.087) [11.36 - 11.83]	-9.10 (0.087)	-9.37, -8.82	<0.001
16:1 Palmitoleic (% Total FA)	0.13 (0.0044) [0.12 - 0.14]	0.11 (0.0044) [0.096 - 0.11]	0.023 (0.0044)	0.0094, 0.037	0.012
17:0 Margaric (% Total FA)	0.036 (0.0070) [0.031 - 0.048]	0.10 (0.0070) [0.085 - 0.12]	-0.067 (0.0073)	-0.091, -0.044	0.002
17:1 9c Heptadecenoic (% Total FA)	0.12 (0.0090) [0.092 - 0.14]	0.031 (0.0090) [0.031 - 0.031]	0.088 (0.013)	0.047, 0.13	0.006
18:0 Stearic (% Total FA)	3.22 (0.072) [3.00 - 3.40]	4.47 (0.072) [4.33 - 4.57]	-1.25 (0.060)	-1.44, -1.06	<0.001
18:1 Oleic (% Total FA)	71.51 (0.85) [69.30 - 73.01]	23.16 (0.85) [21.44 - 25.54]	48.35 (1.21)	45.39, 51.30	<0.001
18:2 6c,9c Octadecadienoic (% Total FA)	0.20 (0.017) [0.16 - 0.24]	0.65 (0.017) [0.63 - 0.69]	-0.46 (0.024)	-0.52, -0.40	<0.001
18:2 Linoleic (% Total FA)	14.41 (0.92) [12.25 - 17.39]	51.08 (0.92) [50.02 - 52.06]	-36.67 (1.18)	-40.44, -32.90	<0.001

**TABLE 3. Statistical Summary of Combined Site Soybean RBD Oil Fraction Fatty Acid and Vitamin E Content for Test (MON 87705) vs. the Conventional Control (A3525) (cont.)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
<b>Fatty Acid (% Total FA)</b>					
18:2 Other Trans (% Total FA)	0.18 (0.017) [0.14 - 0.23]	0.63 (0.017) [0.60 - 0.66]	-0.44 (0.024)	-0.50, -0.39	<0.001
18:3 9c,12c,15t Octadecatrienoic (% Total FA)	0.92 (0.073) [0.81 - 1.01]	0.98 (0.073) [0.80 - 1.19]	-0.059 (0.045)	-0.20, 0.085	0.284
18:3 Linolenic (% Total FA)	4.76 (0.38) [4.08 - 5.46]	5.13 (0.38) [4.21 - 5.96]	-0.37 (0.15)	-0.87, 0.12	0.094
18:3 Other 18:3 Trans (% Total FA)	0.92 (0.067) [0.81 - 1.01]	0.93 (0.067) [0.78 - 1.16]	-0.011 (0.045)	-0.15, 0.13	0.815
20:0 Arachidic (% Total FA)	0.29 (0.0088) [0.27 - 0.31]	0.36 (0.0088) [0.34 - 0.38]	-0.072 (0.0060)	-0.091, -0.053	0.001
20:1 Eicosenoic (% Total FA)	0.33 (0.016) [0.29 - 0.37]	0.19 (0.016) [0.17 - 0.21]	0.14 (0.0086)	0.11, 0.17	<0.001
22:0 Behenic (% Total FA)	0.31 (0.011) [0.30 - 0.35]	0.35 (0.011) [0.33 - 0.38]	-0.034 (0.0033)	-0.044, -0.023	0.001
24:0 Lignoceric (% Total FA)	0.14 (0.018) [0.11 - 0.18]	0.15 (0.018) [0.11 - 0.19]	-0.0056 (0.0036)	-0.017, 0.0059	0.218
<b>Vitamin</b>					
Vitamin E (mg/100g FW)	11.64 (2.96) [6.37 - 17.35]	13.09 (2.96) [7.72 - 20.35]	-1.45 (0.67)	-3.59, 0.70	0.120

<sup>1</sup>FW = fresh weight; FA = fatty acid; S.E. = standard error; CI = Confidence Interval.

**TABLE 4. Statistical Summary of Combined Site Soybean Protein Isolate Fraction Amino Acid and Moisture Content for Test (MON 87705) vs. the Conventional Control (A3525)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
Amino Acid (% DW)					
Alanine (% DW)	3.73 (0.029) [3.66 - 3.81]	3.71 (0.029) [3.64 - 3.76]	0.017 (0.015)	-0.031, 0.064	0.345
Arginine (% DW)	7.84 (0.094) [7.57 - 8.08]	7.83 (0.094) [7.68 - 8.04]	0.0065 (0.11)	-0.34, 0.35	0.955
Aspartic Acid (% DW)	10.88 (0.10) [10.58 - 11.19]	10.87 (0.10) [10.68 - 11.04]	0.013 (0.14)	-0.42, 0.45	0.930
Cystine (% DW)	1.21 (0.024) [1.17 - 1.28]	1.18 (0.024) [1.12 - 1.23]	0.035 (0.034)	-0.050, 0.12	0.351
Glutamic Acid (% DW)	17.52 (0.23) [16.89 - 18.15]	17.66 (0.23) [17.25 - 18.02]	-0.14 (0.20)	-0.77, 0.50	0.540
Glycine (% DW)	3.93 (0.021) [3.87 - 3.98]	3.92 (0.021) [3.90 - 3.97]	0.0027 (0.029)	-0.090, 0.095	0.932
Histidine (% DW)	2.40 (0.019) [2.35 - 2.44]	2.39 (0.019) [2.36 - 2.44]	0.0026 (0.017)	-0.052, 0.058	0.888
Isoleucine (% DW)	4.43 (0.039) [4.35 - 4.48]	4.47 (0.039) [4.36 - 4.56]	-0.032 (0.024)	-0.11, 0.046	0.280
Leucine (% DW)	7.33 (0.037) [7.19 - 7.41]	7.33 (0.037) [7.28 - 7.38]	-0.00005 (0.039)	-0.12, 0.12	0.999

**TABLE 4. Statistical Summary of Combined Site Soybean Protein Isolate Fraction Amino Acid and Moisture Content for Test (MON 87705) vs. the Conventional Control (A3525) (cont.)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
Amino Acid (% DW)					
Lysine (% DW)	5.80 (0.017) [5.75 - 5.83]	5.76 (0.017) [5.74 - 5.81]	0.034 (0.015)	-0.013, 0.081	0.102
Methionine (% DW)	1.27 (0.024) [1.25 - 1.29]	1.24 (0.024) [1.15 - 1.29]	0.035 (0.030)	-0.061, 0.13	0.327
Phenylalanine (% DW)	5.05 (0.038) [4.94 - 5.15]	5.07 (0.038) [5.01 - 5.14]	-0.019 (0.046)	-0.17, 0.13	0.713
Proline (% DW)	5.02 (0.051) [4.91 - 5.11]	5.05 (0.051) [4.92 - 5.17]	-0.033 (0.049)	-0.19, 0.12	0.555
Serine (% DW)	4.96 (0.043) [4.87 - 5.06]	4.92 (0.043) [4.86 - 5.02]	0.043 (0.061)	-0.11, 0.19	0.513
Threonine (% DW)	3.37 (0.037) [3.28 - 3.43]	3.35 (0.037) [3.24 - 3.43]	0.018 (0.0085)	-0.0086, 0.045	0.118
Tryptophan (% DW)	1.05 (0.016) [1.01 - 1.07]	1.04 (0.016) [0.99 - 1.07]	0.0071 (0.011)	-0.027, 0.042	0.556
Tyrosine (% DW)	3.46 (0.012) [3.43 - 3.49]	3.45 (0.012) [3.43 - 3.48]	0.0089 (0.013)	-0.032, 0.050	0.536
Valine (% DW)	4.42 (0.052) [4.34 - 4.49]	4.45 (0.052) [4.29 - 4.58]	-0.031 (0.054)	-0.20, 0.14	0.610

**TABLE 4. Statistical Summary of Combined Site Soybean Protein Isolate Fraction Amino Acid and Moisture Content for Test (MON 87705) vs. the Conventional Control (A3525) (cont.)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
<b>Proximate</b>					
Moisture (% FW)	1.91 (0.28) [1.30 - 2.96]	1.33 (0.28) [0.93 - 1.69]	0.58 (0.27)	-0.27, 1.43	0.117

<sup>1</sup>DW = dry weight; FW = fresh weight; S.E. = standard error; CI = Confidence Interval.



**TABLE 5. Statistical Summary of Combined Site Soybean Lecithin Fraction Phosphatide Content for Test (MON 87705) vs. the Conventional Control (A3525)**

Analytical Component (Units) <sup>1</sup>	MON 87705 Mean (S.E.) [Range]	A3525 Mean (S.E.) [Range]	Difference (Test minus Control)		
			Mean (S.E.)	95% CI (Lower, Upper)	p-Value
<b>Phosphatide</b>					
L-alpha-Phosphatidic Acid (% FW)	1.10 (0.29) [0.35 - 1.64]	1.24 (0.29) [0.35 - 1.60]	-0.14 (0.41)	-1.14, 0.86	0.740
L-alpha-Phosphatidylcholine (% FW)	4.38 (1.04) [1.93 - 7.85]	7.18 (1.04) [5.75 - 9.18]	-2.80 (1.14)	-6.44, 0.83	0.091
L-alpha-Phosphatidylethanolamine (% FW)	2.45 (0.74) [0.65 - 4.79]	4.99 (0.74) [4.06 - 6.70]	-2.55 (0.97)	-5.62, 0.53	0.077
L-alpha-Phosphatidylinositol (% FW)	2.28 (0.66) [1.13 - 4.53]	4.63 (0.66) [3.99 - 6.06]	-2.36 (0.83)	-5.00, 0.29	0.066

<sup>1</sup>FW = fresh weight; S.E. = standard error; CI = Confidence Interval.

**Table 6. Summary of Differences (p<0.05) for the Comparison of Soybean Component Levels for Test (MON 87705) vs. the Conventional Control (A3525)**

Component (Units) <sup>1</sup>	MON 87705 Mean	A3525 Mean	Mean Difference (Test minus Control)		Test Range
			Mean Difference (% of A3525)	Signif. (p-Value)	
<b>Seed Fatty Acid (% Total FA)</b>					
16:0 Palmitic (% Total FA)	2.47	11.58	-78.70	<0.001	[2.34 - 2.56]
18:0 Stearic (% Total FA)	3.26	4.45	-26.75	<0.001	[2.95 - 3.51]
18:1 Oleic (% Total FA)	73.05	23.45	211.46	<0.001	[71.09 - 74.62]
18:2 Linoleic (% Total FA)	13.51	52.33	-74.19	<0.001	[11.39 - 15.93]
20:0 Arachidic (% Total FA)	0.28	0.34	-18.41	0.001	[0.26 - 0.31]
20:1 Eicosenoic (% Total FA)	0.32	0.19	72.19	<0.001	[0.29 - 0.37]
22:0 Behenic (% Total FA)	0.30	0.33	-7.84	0.042	[0.29 - 0.34]
<b>Seed Fiber</b>					
Neutral Detergent Fiber (% DW)	16.80	18.51	-9.26	0.016	[16.17 - 17.80]
<b>Seed Proximate</b>					
Total Fat (% DW)	16.80	17.32	-3.01	0.036	[15.74 - 18.40]
<b>Seed Antinutrient</b>					
Stachyose (% DW)	3.71	3.43	8.28	0.038	[3.55 - 3.99]
<b>Seed Isoflavone</b>					
Daidzein (µg/g DW)	1156.66	939.81	23.07	0.008	[601.88 - 1517.55]
Genistein (µg/g DW)	760.48	642.91	18.29	<0.001	[485.09 - 929.09]

**Table 6. Summary of Differences (p<0.05) for the Comparison of Soybean Component Levels for Test (MON 87705) vs. the Conventional Control (A3525)(cont.)**

Component (Units) <sup>1</sup>	MON 87705 Mean	A3525 Mean	Mean Difference (Test minus Control)		Test Range
			Mean Difference (% of A3525)	Signif. (p-Value)	
<b>Meal Amino Acid (% DW)</b>					
Alanine (% DW)	2.26	2.33	-3.06	0.019	[2.22 - 2.29]
Glycine (% DW)	2.28	2.34	-2.44	0.023	[2.26 - 2.33]
Isoleucine (% DW)	2.45	2.53	-3.17	0.006	[2.40 - 2.51]
Lysine (% DW)	3.25	3.34	-2.49	0.030	[3.22 - 3.29]
Valine (% DW)	2.55	2.64	-3.47	0.003	[2.51 - 2.60]
<b>Meal Fiber</b>					
Neutral Detergent Fiber (% DW)	8.55	6.81	25.47	0.016	[8.05 - 8.96]
<b>RBD Oil Fatty Acid (% Total FA)</b>					
14:0 Myristic (% Total FA)	0.031	0.090	-65.15	<0.001	[0.031 - 0.032]
16:0 Palmitic (% Total FA)	2.49	11.59	-78.50	<0.001	[2.36 - 2.69]
16:1 Palmitoleic (% Total FA)	0.13	0.11	22.10	0.012	[0.12 - 0.14]
17:0 Margaric (% Total FA)	0.036	0.10	-65.27	0.002	[0.031 - 0.048]
17:1 9c Heptadecenoic (% Total FA)	0.12	0.031	279.62	0.006	[0.092 - 0.14]
18:0 Stearic (% Total FA)	3.22	4.47	-28.05	<0.001	[3.00 - 3.40]

**Table 6. Summary of Differences (p<0.05) for the Comparison of Soybean Component Levels for Test (MON 87705) vs. the Conventional Control (A3525)(cont.)**

Component (Units) <sup>1</sup>	MON 87705 Mean	A3525 Mean	Mean Difference (Test minus Control)		Test Range
			Mean Difference (% of A3525)	Signif. (p-Value)	
<b>RBD Oil Fatty Acid (% Total FA)</b>					
18:1 Oleic (% Total FA)	71.51	23.16	208.71	<0.001	[69.30 - 73.01]
18:2 6c,9c Octadecadienoic (% Total FA)	0.20	0.65	-69.86	<0.001	[0.16 - 0.24]
18:2 Linoleic (% Total FA)	14.41	51.08	-71.78	<0.001	[12.25 - 17.39]
18:2 Other Trans (% Total FA)	0.18	0.63	-70.92	<0.001	[0.14 - 0.23]
20:0 Arachidic (% Total FA)	0.29	0.36	-19.97	0.001	[0.27 - 0.31]
20:1 Eicosenoic (% Total FA)	0.33	0.19	73.17	<0.001	[0.29 - 0.37]
22:0 Behenic (% Total FA)	0.31	0.35	-9.74	0.001	[0.30 - 0.35]

<sup>1</sup>DW = dry weight; FA = fatty acid.

**Listing 1. Components Excluded from Summary and Analysis Due to Excessive Observations Below the Assay's Limit of Quantitation**

Fraction	Category	Component	(N) Below LOQ	(N) Total	(%)
Seed	Fatty Acid	10:0 Capric	16	16	100.0
		12:0 Lauric	16	16	100.0
		14:0 Myristic	16	16	100.0
		14:1 Myristoleic	16	16	100.0
		15:0 Pentadecylic	16	16	100.0
		15:1 10c Pentadecenoic	16	16	100.0
		16:1 Palmitelaidic	16	16	100.0
		16:1 Palmitoleic	14	16	87.5
		17:0 Margaric	16	16	100.0
		17:1 9c Heptadecenoic	13	16	81.3
		18:1 Elaidic	16	16	100.0
		18:2 6c,9c Octadecadienoic	16	16	100.0
		18:2 9c,15c Octadecadienoic	16	16	100.0
		18:2 Linolelaidic	16	16	100.0
		18:2 Other Trans	16	16	100.0
		18:3 9c,12c,15t Octadecatrienoic	16	16	100.0
		18:3 Gamma Linolenic	16	16	100.0

**Listing 1. Components Excluded from Summary and Analysis Due to Excessive Observations Below the Assay's Limit of Quantitation**

Fraction	Category	Component	(N) Below LOQ	(N) Total	(%)
RBD Oil	Fatty Acid	18:3 Other 18:3 Trans	16	16	100.0
		18:4 6c,9c,12c,15t Octadecatetraenoic	16	16	100.0
		18:4 Stearidonic (SDA)	16	16	100.0
		20:2 11c,14c Eicosadienoic	16	16	100.0
		20:3 11c,14c,17c Eicosatrienoic	16	16	100.0
		20:4 Arachidonic	16	16	100.0
		20:5 5c,8c,11c,14c,17c Eicosapentaenoic (EPA)	16	16	100.0
		22:1 Erucic	16	16	100.0
		22:5 7c,10c,13c,16c,19c Docosapentaenoic (DPA)	16	16	100.0
		22:6 4c,7c,10c,13c,16c,19c Docosahexaenoic (DHA)	16	16	100.0
		24:1 Nervonic	16	16	100.0
		8:0 Caprylic	16	16	100.0
		10:0 Capric	16	16	100.0
		12:0 Lauric	16	16	100.0
		14:1 Myristoleic	16	16	100.0
		15:0 Pentadecylic	16	16	100.0
		15:1 10c Pentadecenoic	16	16	100.0

**Listing 1. Components Excluded from Summary and Analysis Due to Excessive Observations Below the Assay's Limit of Quantitation**

Fraction	Category	Component	(N) Below LOQ	(N) Total	(%)
		16:1 Palmitelaidic	16	16	100.0
		18:1 Elaidic	12	16	75.0
		18:2 9c,15c Octadecadienoic	11	16	68.8
		18:2 Linolelaidic	16	16	100.0
		18:3 Gamma Linolenic	16	16	100.0
		18:4 6c,9c,12c,15t Octadecatetraenoic	16	16	100.0
		18:4 Stearidonic (SDA)	16	16	100.0
		20:2 11c,14c Eicosadienoic	16	16	100.0
		20:3 11c,14c,17c Eicosatrienoic	16	16	100.0
		20:4 Arachidonic	16	16	100.0
		20:5 5c,8c,11c,14c,17c Eicosapentaenoic (EPA)	16	16	100.0
		22:1 Erucic	16	16	100.0
		22:5 7c,10c,13c,16c,19c Docosapentaenoic (DPA)	16	16	100.0
		22:6 4c,7c,10c,13c,16c,19c Docosahexaenoic (DHA)	16	16	100.0
		24:1 Nervonic	16	16	100.0
		8:0 Caprylic	16	16	100.0

**Listing 2. Components with Observations Below the Assay's Limit of Quantitation Not Excluded from Summaries and Analysis**

Fraction	Category	Component	Material	Site	Rep	Original Value	Value Assigned
Seed	Fatty Acid	24:0 Lignoceric	A3525	Site IA	1	< 0.0200	0.010
				Site IA	1	< 0.0200	0.010
				Site IA	2	< 0.0200	0.010
				Site IA	2	< 0.0200	0.010
			MON 87705	Site IA	2	< 0.0200	0.010
				Site IA	2	< 0.0200	0.010
				Site IA	1	< 0.0200	0.010
				Site IA	1	< 0.0200	0.010
			A3525	Site IA	1	< 1.00	0.50
				Site IA	2	< 1.00	0.50
				Site IA	2	< 1.00	0.50
				Site IA	2	< 1.00	0.50
Meal	Antinutrient	Trypsin Inhibitor	A3525	Site IA	1	< 1.00	0.50
				Site IA	2	< 1.00	0.50
				Site IA	2	< 1.00	0.50
				Site IA	2	< 1.00	0.50
			MON 87705	Site IL	2	< 1.00	0.50
				Site IL	2	< 1.00	0.50
				Site IL	2	< 1.00	0.50
				Site IL	2	< 1.00	0.50
			MON 87705	Site IA	1	< 0.0600	0.030
				Site IA	1	< 0.0600	0.030
				Site IA	2	< 0.0600	0.030
				Site IA	2	< 0.0600	0.030
				Site IL	1	< 0.0600	0.030
				Site IL	1	< 0.0600	0.030
				Site IL	2	< 0.0600	0.030
				Site IL	2	< 0.0600	0.030
RBD Oil	Fatty Acid	14:0 Myristic	MON 87705	Site IA	1	< 0.0600	0.030
				Site IA	1	< 0.0600	0.030
				Site IA	2	< 0.0600	0.030
				Site IA	2	< 0.0600	0.030
				Site IL	1	< 0.0600	0.030
				Site IL	1	< 0.0600	0.030
				Site IL	2	< 0.0600	0.030
				Site IL	2	< 0.0600	0.030
		17:0 Margaric	MON 87705	Site IA	1	< 0.0600	0.030
				Site IA	2	< 0.0600	0.030
				Site IA	2	< 0.0600	0.030
				Site IL	1	< 0.0600	0.030
				Site IL	1	< 0.0600	0.030
				Site IL	2	< 0.0600	0.030
				Site IL	2	< 0.0600	0.030
				Site IL	2	< 0.0600	0.030



**Listing 2. Components with Observations Below the Assay's Limit of Quantitation Not Excluded from Summaries and Analysis**

Fraction	Category	Component	Material	Site	Rep	Original Value	Value Assigned
		17:1 9c Heptadecenoic	A3525	Site IA	1	< 0.0600	0.030
				Site IA	1	< 0.0600	0.030
				Site IA	2	< 0.0600	0.030
				Site IA	2	< 0.0600	0.030
				Site IL	1	< 0.0600	0.030
				Site IL	1	< 0.0600	0.030
				Site IL	2	< 0.0600	0.030
				Site IL	2	< 0.0600	0.030
Lecithin	Phosphatide	L-alpha-Phosphatidic Acid	A3525	Site IA	1	< 0.70	0.35
				Site IA	1	< 0.70	0.35
			MON 87705	Site IL	1	< 0.70	0.35
				Site IL	1	< 0.70	0.35
		L-alpha-Phosphatidylethanolamine	MON 87705	Site IL	1	< 1.30	0.65
				Site IL	1	< 1.30	0.65