

2011 Food Soybean Quality Survey

2011年 食品大豆品質調查

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2011 Survey Methods

2011年調査方法


- In late August, sample kits were mailed to 93 U.S. soybean export companies throughout the U.S.

8月後半に米国中の輸出会社93社にサンプル・キットを郵送した

- By October 25,
199 samples were
returned for analysis

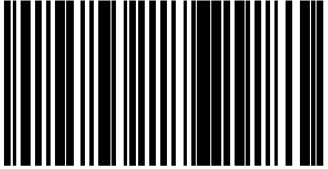
10月25日までに
199のサンプルが
分析用に届いた

* PLEASE SEND SAMPLES BY OCTOBER 20 *



ASA
American Soybean Association
International
Marketing®

2011 Food Soybean Quality Survey



20119800106

Variety (name/number and company): _____

Intended use:
 Tofu Natto Miso Other _____

Additional characteristics:
 Special oil Non-GMO Organic
 Other _____

Field location (zip code or town, state): _____

Producer name or specific field identifier: _____

Contracting company: _____

Questions? Call Dr. Seth Naeve at (612) 625-4298

2011 Survey Methods: 調査方法

Protein and Oil 蛋白質と油分

- Samples were analyzed for protein and oil concentration by Near Infrared Spectroscopy (NIRS) using a Perten® diode array instrument

Pertenのダイオードアレイ検出器使用の近赤外分光分析法（NIRS）でサンプルの蛋白質と油分を分析した

- Average protein and oil values were determined by state

州別の蛋白質、油分の平均値を出した





Amino Acids アミノ酸

- All samples were subsequently ground and rescanned using NIRS to facilitate analysis for amino acids and soluble sugars
すべてのサンプルはその後グラインドし(細かく砕き)、アミノ酸と可溶性糖を分析するために、NIRSを使って再検査をした

2011 Food Soybean Quality Survey

2011年食品大豆品質調査

 Samples are grouped by region:

サンプルは地域別にグループ分けをした

Northern = Michigan, Minnesota, North Dakota, Wisconsin

北部＝ミシガン、ミネソタ、北ダコタ、ウィスコンシン

Central = Illinois, Indiana, Iowa, Missouri, Nebraska, and Ohio

中央部＝イリノイ、インディアナ、アイオワ、ミズーリ、ネブラスカ、オハイオ

and seed size: 粒サイズ

Small seed size samples (≤ 13 g/100 seeds) 小粒サンプル

Average (13.1 – 21 g/100 seeds) 中粒（平均）

Large (> 21 g/100 seeds) 大粒

2011 Food Soybean Quality Survey Results

2011年食品大豆品質調查結果



ASA-IM 2011年州・地域別食品大豆品質調査

Table 2. ASA-IM 2011 Food Soybean Quality Survey by State and Region

State (# of samples)	Region	Protein* (%)	Regional Protein Average	Oil* (%)	Regional Oil Average
Michigan (49)	Northern	38.1		16.3	
Minnesota (48)	Northern	37.8		16.3	
North Dakota (15)	Northern	36.6		16.6	
Wisconsin (15)	Northern	35.6	37.5	17.6	16.5
Illinois (6)	Central	34.4		19.9	
Indiana (2)	Central	36.9		18.9	
Iowa (38)	Central	37.3		17.0	
Missouri (18)	Central	37.6		17.6	
Nebraska (2)	Central	35.5		17.1	
Ohio (6)	Central	40.3	37.3	16.2	17.4

Data as of October 27, 2011

* 13% moisture basis

ASA-IM 2011年食品大豆品質調査—種子サイズ&地域別

Table 3. ASA-IM 2011 Food Soybean Quality Survey by Seed Size[§] & Region

Region	Seed Size	Number Samples	Seed Size (g/100 seeds)	Protein* (%)	Oil* (%)
Northern	Small	12	10.1	36.1	16.2
	Average	100	16.8	37.2	16.7
	Large	15	23.0	40.6	15.1
Central	Small	6	12.4	35.8	17.7
	Average	63	15.4	37.3	17.4
	Large	3	23.2	40.8	16.2

Data as of October 27, 2011

[§] Small seed: ≤13.0 g/100 seeds; Average: 13.1-21.0 g/100 seeds; Large: >21 g/100 seeds (unofficial categories)

* 13% moisture basis

ASA-IM 2011年食品大豆調査－種子サイズ&地域別NIR予測炭水化物データ

Table 4. ASA-IM 2011 Food Soybean Quality Survey NIR-predicted Carbohydrate Data by Seed Size & Region

Region	Seed Size	Number Samples	Seed Size Average (g/100 seeds)	Sucrose (% DM basis)	Raffinose (% DM basis)	Stachyose (% DM basis)
Northern	Small	12	10.1	5.48	0.56	3.64
	Average	100	16.8	5.09	0.53	3.64
	Large	15	23.0	4.89	0.52	3.76
Central	Small	6	12.4	5.20	0.54	3.98
	Average	63	15.4	4.58	0.53	3.77
	Large	3	23.2	4.46	0.50	3.67

Data as of October 27, 2011

ASA-IM 2011年食品大豆品質調査 — 種子サイズ&地域別NIR-予測アミノ酸データ

Table 5. ASA-IM 2011 Food Soybean Quality Survey NIR-predicted Amino Acid Data by Seed Size & Region

Region	Seed Size	Number Samples	Seed Size Average (g/100 seeds)	Protein* (%)	Lysine (as % of P)	Essential[¶] Amino Acids (as % of P)	Non-Essential[†] Amino Acids (as % of P)
	Small	12	10.1	36.1	6.0	39.0	56.7
Northern	Average	100	16.8	37.2	5.7	38.4	56.1
	Large	15	23.0	40.6	5.2	36.5	54.4
	Small	6	12.4	35.8	5.7	39.2	57.5
Central	Average	63	15.4	37.3	5.6	38.4	56.5
	Large	3	23.2	40.8	5.1	36.1	54.1

Data as of October 27, 2011

[¶]Essential amino acids: leucine, histidine, isoleucine, lysine, methionine, phenylalanine, threonine, tryptophan, valine, and cysteine

[†]Non-essential amino acids: alanine, arginine, aspartic acid, glutamic acid, glycine, proline, serine, and tyrosine

2011 Food Soybean Quality Survey

2011年食品大豆品質調査

Results 結果

- 199 samples received by October 27
10月27日までに199のサンプルを受領
- A lot of variability in protein and oil concentrations, due to variable environmental growing conditions in the US (T2, T3)
米国内の変わりやすい環境生育状況により、蛋白質及び油分値の変動が大きい
- **Protein**: large seed size samples > average > small (T3)
蛋白質：大粒のサンプル > 中粒 > 小粒
- **Oil**: large seed size samples > average > small (T3)
油分：大粒 > 中粒 > 小粒

2011 Food Soybean Quality Survey 2011年食品大豆品質調査

Results continued 結果(続き)

- **Soluble sugars**: Northern and Central regions show the same trend for **sucrose**: small > average > large; **raffinose**: very similar north and south; **stachyose**: lower in Northern samples for small and average seeds (T4)
可溶性糖：北部と中央部の地域は蔗糖と同じ傾向を示した：小粒>中粒>大粒、ラフィノース：北部、南部で非常に似た傾向、スタキオース：北部の小粒、中粒のサンプルは 低め
- **Amino acids**: the lower protein samples had higher **lysine**, **essential amino acids**, and **non-essential amino acids** compared to the higher protein samples (T5)
アミノ酸：低蛋白質のサンプルは高蛋白質のサンプルと比べて、リジン、必須アミノ酸、可欠アミノ酸が高め

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Conclusions 結論

- North-South protein differences were minor – this is not normally what we see; environmental conditions very variable

北部-南部の蛋白質の差は小さい—これは通常目にするものと違う。非常に変わりやすい環境状態だった

- Different seed size categories fell into patterns consistent with previous surveys: (ex.) small seed size samples have lower *protein* and higher *sucrose* than larger-seeded samples

異なる種子サイズカテゴリーは前回の調査と同じパターンを示した：
小粒サンプルは大粒のサンプルよりも蛋白質が低く、蔗糖が高い

- *Lower protein samples* have higher concentrations of:

低蛋白質のサンプルは次の値が高い

- lysine リジン
- essential amino acids 必須アミノ酸
- non-essential amino acids 可欠アミノ酸