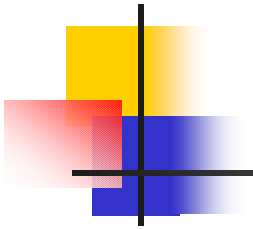
Collaborative Results and Information

ANKOM TECHNOLOGY



Overview

- **The goal of this presentation is to provide information on a rapid, high volume, Officially approved PRIMARY method for fat/oil extraction, that will reduce labor costs, reduce solvent usage and increase accuracy and precision.**

Features and Benefits

AOCS Official Approved Procedure, Am 5-04	The system has been proven in rigorous testing
90°C Extraction temperatures & Filter Bag Technology	Greatly reduces extraction time.
Totally Automatic	Free up technicians for other work
Automatic Solvent recycle and Recovery	Reduces solvent usage to ~2ml per sample
Primary Method	Can be used to monitor/calibrate secondary methods

What Sample Types?

- **Oilseeds** – Corn, Soybean, Soy meal, Canola, Safflower, etc.
- **Meats** – Beef, Turkey, Chicken, Sausage, further processed meats, etc.
- **Animal Feeds** – Pet Foods, Cattle Feeds, Poultry Feeds, Forages, Corn Silages, etc.
- **Other Foods** – Brownie Mixes, Baked Goods, Cereals, Snack Foods, Cookies, etc.

Comparative Study

22 Sample Types – 5 reps each

$R^2 = 0.9996$

	Conventional		FBT	
Sample	%Fat/Oil	SD	%Fat/Oil	SD
Rice Hulls	0.3	0.07	0.2	0.08
Soybean Meal	1.4	0.01	1.7	0.05
Pig Starter	1.8	0.05	1.9	0.11
Chick Grower	2.2	0.10	2.2	0.10
Cattle Feed	2.7	0.10	2.8	0.08
Corn	3.0	0.07	3.5	0.12
Chicken Breast	3.2	0.07	3.1	0.05
Blueberry muffin	4.6	0.41	4.7	0.39
Oatmeal	5.9	0.08	5.7	0.21
Brownie Mix	8.8	0.07	8.5	0.15
Turkey	8.9	0.11	8.7	0.07
Fish Meal	9.9	0.07	9.8	0.16
Ham	10.6	0.03	10.9	0.11
Soybeans	21.3	0.08	21.0	0.44
Horse feed	22.1	0.18	22.2	0.05
Tortilla Chips	24.2	0.22	24.2	0.26
Ground Beef	28.4	0.16	28.6	0.23
Chicken Thighs	29.1	0.09	29.2	0.13
Sausage	36.4	0.35	36.7	0.62
Safflower	40.4	0.22	39.5	0.20
Canola	41.4	0.07	41.7	0.12
Cheese Curls	43.3	0.06	43.2	0.29

AOCS Collaborative Results Meats

Statistical Analysis provided by AOCS

Sample Type	turkey	ham	beef ground	chicken breast	hot dog	sausage
Number of laboratories	12	9	11	11	12	11
Number of replicates	24	18	22	22	24	22
Collaborative Average, Oil/Fat %	3.2	11.6	23.8	2.8	39.5	25.7
Certified Labs Average[a]	3.2	11.3	23.5	2.7	39.0	25.0
Repeatability						
s(r) = repeatability std dev	0.21	0.30	0.24	0.33	0.35	0.34
RSD(r) = repeatability rel. std. Dev	6.57	2.59	1.01	11.89	0.89	1.33
r = repeatability value	0.58	0.84	0.67	0.94	0.98	0.96
Reproducibility						
s(R) = reproducibility std dev	0.34	0.30	0.36	0.33	0.59	0.51
RSD(R) = reproducibility rel std. Dev	10.84	2.59	1.49	11.89	1.49	1.98
R = reproducibility value	0.96	0.84	0.99	0.94	1.65	1.43

AOCS Collaborative Results Oilseeds

Statistical Analysis provided by AOCS

Sample Type	soybean A	canola	soybean meal	corn A	soybean B	safflower	corn B
Number of laboratories	11	9	12	12	11	9	12
Number of replicates	22	18	24	24	22	18	24
Collaborative Average, Oil/Fat %	20.9	39.0	1.6	3.3	19.4	22.5	3.4
Certified Labs Average[a]	21.1	39.7	1.6	3.6	19.7	23.0	3.7
Repeatability							
s(r) = repeatability std dev	0.35	0.23	0.14	0.31	0.38	0.53	0.39
RSD(r) = repeatability rel. std. Dev	1.7	0.6	8.5	9.5	1.97	2.36	11.48
r = repeatability value	0.98	0.65	0.39	0.88	1.07	1.49	1.10
Reproducibility							
s(R) = reproducibility std dev	0.63	0.68	0.27	0.42	0.62	0.83	0.41
RSD(R) = reproducibility rel std. Dev	3.0	1.7	16.3	12.7	3.19	3.69	11.93
R = reproducibility value	1.76	1.90	0.75	1.18	1.73	2.33	1.14

AOCS Collaborative Results
Feeds & Forages *(includes Pet Foods)*

Statistical Analysis provided by AOCS

Sample Type	poultry starter	cattle feed	pig starter	alfalfa	cat food	dog food	corn silage
Number of laboratories	11	10	11	11	12	12	12
Number of replicates	22	20	22	22	24	24	24
Collaborative Average, Oil/Fat %	3.3	3.2	5.6	2.4	6.3	6.8	2.3
Certified Labs Average[a]	3.5	3.0	5.5	2.2	6.2	6.9	2.3
Repeatability							
s(r) = repeatability std dev	0.24	0.18	0.20	0.39	0.27	0.35	0.23
RSD(r) = repeatability rel. std. Dev	7.3	5.6	3.6	16.1	4.2	5.23	9.87
r = repeatability value	0.68	0.51	0.56	1.08	0.75	0.99	0.63
Reproducibility							
s(R) = reproducibility std dev	0.42	0.20	0.28	0.50	0.30	0.35	0.51
RSD(R) = reproducibility rel std. Dev	12.6	6.1	5.0	20.7	4.7	5.23	22.45
R = reproducibility value	1.16	0.55	0.78	1.39	0.83	0.99	1.44

AOCS Collaborative Results Other Foods

Statistical Analysis provided by AOCS

Sample Type	oat meal	brownie mix	cookies	bkft cereal	tortilla chips	crackers	potato chips	cheese curls
Number of laboratories	12	12	11	12	12	10	11	12
Number of replicates	24	24	22	24	24	20	22	24
Collaborative Average, Oil/Fat %	5.8	8.7	22.7	2.3	19.9	23.8	32.0	30.6
Certified Labs Average [a]	5.7	8.7	23.1	2.3	20.0	24.0	32.0	30.5
Repeatability								
s(r) = repeatability std dev	0.36	0.20	0.20	0.26	0.39	0.23	0.48	0.48
RSD(r) = repeatability rel. std. Dev	6.2	2.3	0.9	11.4	2.0	0.96	1.49	1.59
r = repeatability value	0.99	0.56	0.56	0.72	1.09	0.64	1.34	1.36
Reproducibility								
s(R) = reproducibility std dev	0.54	0.31	0.20	0.36	0.48	0.23	0.52	0.69
RSD(R) = reproducibility rel std. Dev	9.4	3.5	0.9	15.7	2.4	0.96	1.61	2.27
R = reproducibility value	1.52	0.86	0.56	1.00	1.35	0.64	1.45	1.94

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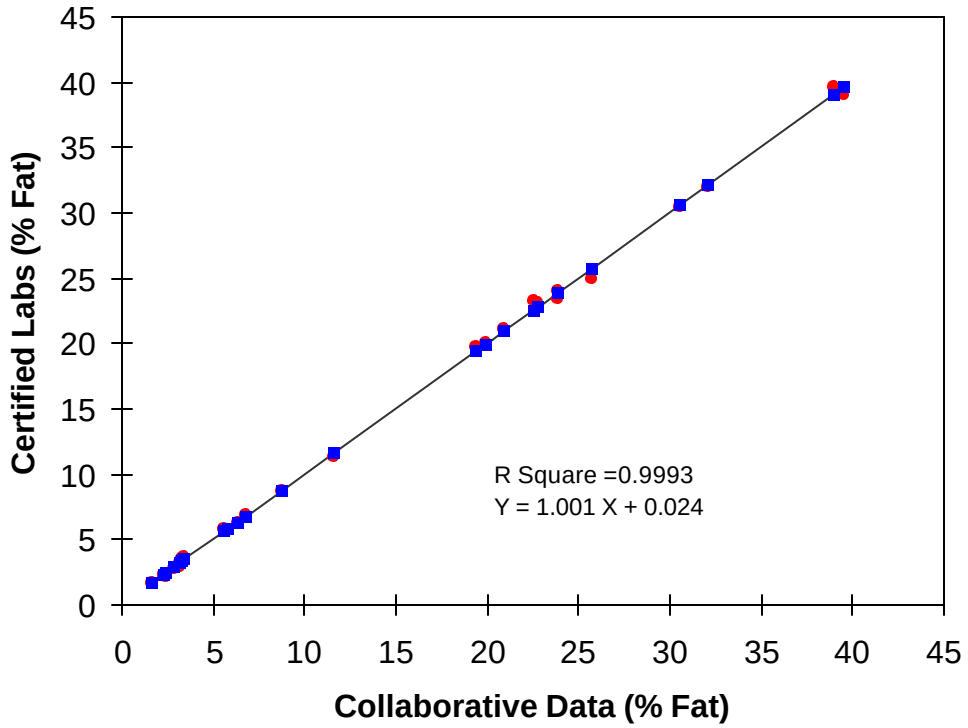
Regression Analysis



= *Certified Labs*

= *Collaborative Labs*

Some Key Users From Around the World