

Analysis of Animal Feed Products Sold in Connecticut 2017

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Animal Feed Regulatory Program For Label Guarantees

INTRODUCTION

In the State of Connecticut The Agricultural Commodities Division of The Department of Agriculture is responsible for the regulation and inspection of animal feeding products and pet foods. These products are delivered to The Department of Analytical Chemistry at The Connecticut Agricultural Experiment Station for analysis to ensure label compliance (1).

METHODS

In calendar year 2017, The Department of Analytical Chemistry at The Connecticut Agricultural Experiment Station analyzed 23 animal feeding products for sale in Connecticut. These products were collected by The Department of Agriculture and delivered to the Department of Analytical Chemistry by Agricultural Commodities Inspectors. The products were collected at manufacturing facilities and wholesale dealers from bulk storage/delivery, as well as from retail stores in bags, boxes, and cans. The animal feeding products, along with their manufacturer/dealer, can be found in Tables 1 and 2.

After delivery to The Connecticut Agricultural Experiment Station, the animal feeding products were sub sampled and prepared for analysis. We note that not all submitted samples have the same requested analysis. The samples were analyzed for protein, fat, fiber, and moisture based on modified methods described in Official Methods of Analysis (2). Micronutrients were determined after sample digestion in acid by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectroscopy and ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy).

RESULTS AND DISCUSSION

Animal feed products are reported to be unsatisfactory if the amount of a guaranteed substance is found to differ from the label guarantee according to the percent analytical variation guidelines as established by the Association of American Feed Control Officials (AAFCO) (3).

The number of samples deemed unsatisfactory in one or more macronutrients was 7 (30%). Specifically 2 (8.7%) were deficient in protein; 3 (13.0%) were deficient in fat, 1 (4.3%) was deficient in fiber and 2 (8.7%) contained an excess of fiber. Of the 9 samples analyzed for micronutrients, 5 (56 %) were found to be unsatisfactory in one or more guaranteed nutrient value.

Tables 1 and 2 show the results for the analysis of macronutrients and micronutrients, where the label guaranteed nutrient value is denoted as (G) and the laboratory determined nutrient value is denoted as (R). Deficiencies and excesses of a guaranteed nutrient are expressed in red. Micronutrient values are expressed as percent unless otherwise noted.

When the laboratory determined value of a nutrient is found to be unsatisfactory, that sample is always reanalyzed. All samples are analyzed as reps A and B. Tables 1 and 2 contain the results for each sample which reflects the average of however many times a sample was analyzed. The number of reanalyzes of an unsatisfactory sample can vary.

Table 1. A comparison between label guarantees (G) and analytical results (R) for animal feeds received from the Connecticut Department of Agriculture for the calendar year 2017. Values in red indicate results that did not meet specific adjusted label guarantees.

Sample ID	Brand	Description	Protein %		Crude Fat %		Crude Fiber %			Calcium %			Potassium %		Copper ppm	
			G	R	G	R	G _{min}	G _{max}	R	G _{min}	G _{max}	R	G	R	G	R
KN17-01	Wauregan Feeds	Mustang 14% Horse Pellet	14.0	19.1	3.0	4.49	12.0		9.28	0.75	0.20	4.5			40.0	11.64
KN17-02	Wauregan Feeds	Hay + Pasture Extender	12.0	15	2.5	3.76	20.0	25.0	14.9							
KN17-03	Wauregan Feeds	Equine Gold 12, 10% Fat	12.0	14	10.0	8.34	12.5		9.71	0.70	0.80	4.59			45.0	37.45
KN17-04	Wauregan Feeds	Milkers Choice 1680	16.0	16	3.0	3.54	8.0		7.99	0.60	1.30	3.46	0.8	1.1		
KN17-05	Wauregan Feeds	Calf Starter (B) medicated	20.0	22	3.0	4.93	8.0		8.23							
KN17-06	Wauregan	Sheep + Goat	18.0	17	3.0	5.09	7.0		9.05							
KN17-07	Wauregan	Rabbit Pellets	20.0	20	2.5	2.96	18.0		11.5							
WSN16-001	DuMor Chick	Starter Grower 20%	20.0	20	2.5	1.21	4.5		4.49	0.70	1.20	1.01				
WSN16-002	Producers	Pride Hog Grower	15.0	16	3.0	2.70	5.0		4.73	1.00	1.50	1.38				
WSN16-003	DuMor	Equistages	14.0	15	6.0	6.20	18.0		14.3	0.80	1.30	1.25			50.0	55.12
WSN17-01	Wellness	Just for Puppy	9.0	11	7.0	9.42	1.0		2.10							
WSN17-02	Wellness	Duck + Sweet Potato Formula	8.0	10	5.0	5.60	1.0		1.35							
WSN17-03	Blue	Lamb Dinner w/ garden veg	10.0	10	8.0	11.9	1.5		1.08							
WSN17-04	Blue	Freedom Chicken Recipe	8.0	9.5	6.0	8.7	1.0		1.23							
WSN17-05	Merrick	Cowboy Cookout	9.0	10	3.0	3.0	1.4		0.32							
WSN17-06	Merrick	Star Spangled Supper	8.0	12	3.0	3.7	1.8		0.68							
WSN17-07	Daves	Poached Salmon Entrée	8.0	15	6.0	5.4	1.3		0.59							
WSN17-08	Daves	95% Premium Turkey	10.0	9.4	8.5	9.5	1.0		1.19							
WSN17-09	Taste of The Wild	Wetlands Cannine Formula	8.0	9.5	3.5	6.3	1.0		0.46							
WSN17-10	Taste of The Wild	Sierra Mountain Cannine Formula	8.0	8.7	4.5	6.3	1.0		0.37							
WSN17-11	Nutrena Country Feeds	Gamebird Turkey Grower 21%	21.0	22	3.0	3.8	5.0		4.81	0.95	1.45	1.05				
WSN17-12	Nutrena Country Feeds	Sheep 16% Pellet	16.0	17	3.0	2.9	14.0		13.4	0.80	1.00	1.12				
WSN17-13	Nutrena Country Feeds	Grower/Finisher Pig Feed 16%	16.0	16	3.0	3.1	7.0		5.70	0.60	1.20	0.81				

Table 2. A comparison between label guarantees (G) and analytical results (R) for animal feeds received from the Connecticut Department of Agriculture for the calendar year 2017. Values in red indicate results that did not meet specific adjusted label guarantees.

Sample ID	Brand	Description	Magnesium %		Sodium chloride %			Phosphorus %		Sulfur %		Zinc ppm	
			G	R	G _{min}	G _{max}	R	G	R	G	R	G	R
KN17-01	Wauregan Feeds	Mustang 14% Horse Pellet						0.50	1.03			115	82
KN17-02	Wauregan Feeds	Hay + Pasture Extender											
KN17-03	Wauregan Feeds	Equine Gold 12, 10% Fat						0.50	0.85			125	156
KN17-04	Wauregan Feeds	Milkers Choice 1680	0.30	0.48				0.60	0.95	0.30	0.32		
KN17-05	Wauregan Feeds	Calf Starter (B) medicated											
KN17-06	Wauregan	Sheep + Goat											
KN17-07	Wauregan	Rabbit Pellets											
WSN16-001	DuMor Chick	Starter Grower 20%			0.25	0.75	0.45	0.55	0.71				
WSN16-002	Producers	Pride Hog Grower			0.40	0.90	0.99	0.65	0.68			80	124
WSN16-003	DuMor	Equistages						0.50	0.8			150	171
WSN17-01	Wellness	Just for Puppy											
WSN17-02	Wellness	Duck + Sweet Potato Formula											
WSN17-03	Blue	Lamb Dinner w/ garden veg											
WSN17-04	Blue	Freedom Chicken Recipe											
WSN17-05	Merrick	Cowboy Cookout											
WSN17-06	Merrick	Star Spangled Supper											
WSN17-07	Daves	Poached Salmon Entrée											
WSN17-08	Daves	95% Premium Turkey											
WSN17-09	Taste of The Wild	Wetlands Canine Formula											
WSN17-10	Taste of The Wild	Sierra Mountain Canine Formula											
WSN17-11	Nutrena Country Feeds	Gamebird Turkey Grower 21%			0.35	0.55	0.43						
WSN17-12	Nutrena Country Feeds	Sheep 16% Pellet			1.00	1.50	0.39	0.40	0.77				
WSN17-13	Nutrena Country Feeds	Grower/Finisher Pig Feed 16%			0.25	0.75	0.44	0.50	0.73			125	175

Animal Feed Regulatory Program Standards (AFRPS)

In cooperation with the CT Department of Agriculture and the US Food and Drug Administration (FDA), the CAES began to analyze select animal feeds for aflatoxins as part of the Animal Feeds Regulatory Program Standards (AFRPS) on April 2017.

Aflatoxins are carcinogens that can form on grains such as corn or peanuts and have been found in pet food (4). These chemicals are secondary metabolites produced by the fungus *Aspergillus flavus* (aflatoxin derives from *A. flavus* + toxin). Aflatoxins consist of four main metabolites; B1, B2, G1 and G2. The metabolite B1 is considered the most toxic and predominant. If ingested, B1 can be transformed into aflatoxins M1 and M2, which can be transferred to other animals. The toxins can also enter the human food chain both by direct consumption of the product, or through livestock that have eaten the contaminated product.

The US Food and Drug Administration (FDA) suggest a 20 µg/kg limit for aflatoxins in corn for dairy animal feed. At CAES we test contaminants in food, including the detection and quantification of aflatoxins in animal feed by liquid chromatography with high resolution mass spectroscopy (LC-HRMS). The samples tested for aflatoxins in 2017 are listed in Table 3. For all samples, the metabolite levels reported were below the LC-HRMS detection limits of 1 µg/kg.

Table 3. List of animal feed products tested for aflatoxins B1, B2, G1 and G2 in the year 2017.

Sample	Description	Brand/Regist
WNMT-01	Cracked corn	Pleasant View Farms Inc.
WNMT-02	Whole corn	Pleasant View Farms Inc.
WNMT-03	Cracked corn	Cooperative Field Dealers Inc.
WNMT-04	Cracked corn	Country Feeds - Nutrena
WNMT-05	Whole corn	Country Feeds - Nutrena
WNMT-06	Corn meal	Blue Seal - Kent Nutrition
WSN18-01	Cracked corn	Country Feeds - Nutrena
WSN18-02	Whole corn	Country Feeds - Nutrena
WSN18-03	Whole corn	Country Feeds - Nutrena
WSN18-04	Whole corn	Country Feeds - Nutrena
WSN18-05	Cracked corn	Country Feeds - Nutrena
WSN18-06	Whole corn	Poulin Grain Inc.
WSN18-07	Cracked corn	Blue Seal - Kent Nutrition
WSN18-08	Cracked corn	Country Feeds - Nutrena
KAC1801	Whole corn	Manna Pro Products LLC
17-MMZ-002	Whole shelled corn	Bass Pro Shops
MZ 18-001	Whole corn	Wauregan Grain Co.
MZ 18-002	Whole corn	Tractor Supply Co.
MZ 18-003	Cracked corn	Tractor Supply Co.
WSN 18-09	Whole corn	Blue Seal - Kent Nutrition
WSN 18-10	Corn meal	Blue Seal - Kent Nutrition
WSN18-11	Whole corn	Country Feeds - Nutrena
WSN18-12	Cracked corn	Country Feeds - Nutrena
WSN18-13	Cracked corn	Country Feeds - Nutrena
WSN18-14	Cracked corn	Tractor Supply Co.
WSN18-15	Whole corn	Tractor Supply Co.
WSN18-16	Wildlife Corn	Blue Seal - Kent Nutrition
WSN18-17	Cracked corn	Country Feeds - Nutrena
WSN18-18	Whole corn	Blue Seal - Kent Nutrition

REFERENCES

1. The Connecticut Department of Agriculture; Agricultural Commodities Division, <http://www.ct.gov/doag/site/default.asp>.
2. Official Methods of Analysis. 1980 13th edition, W. Horowitz, ed. Association of Official Analytical Chemists, Washington, D.C.
3. 2014 Official Publication Association of American Feed Control Officials; 2014, <http://www.aafco.org>.
4. US Food and Drug Administration, <https://www.fda.gov/ICECI/ComplianceManuals/CompliancePolicyGuidanceManual/ucm074703.htm>.

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