

# Summit Ridge Farms

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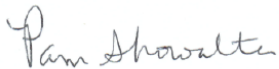
## Canine Digestibility Assessment of Diet

### NOOD Pet Food

Study #NDIDIGC00119

Submitted to:  
NOOD Pet Food  
6535 MillCreek Drive  
Mississauga Ontario Canada

Dates of Performance:  
6/01/2019  
to  
6/10/2019



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Date: 2019.07.01 12:22:54 -04'00'

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Pam Showalter  
Study Coordinator

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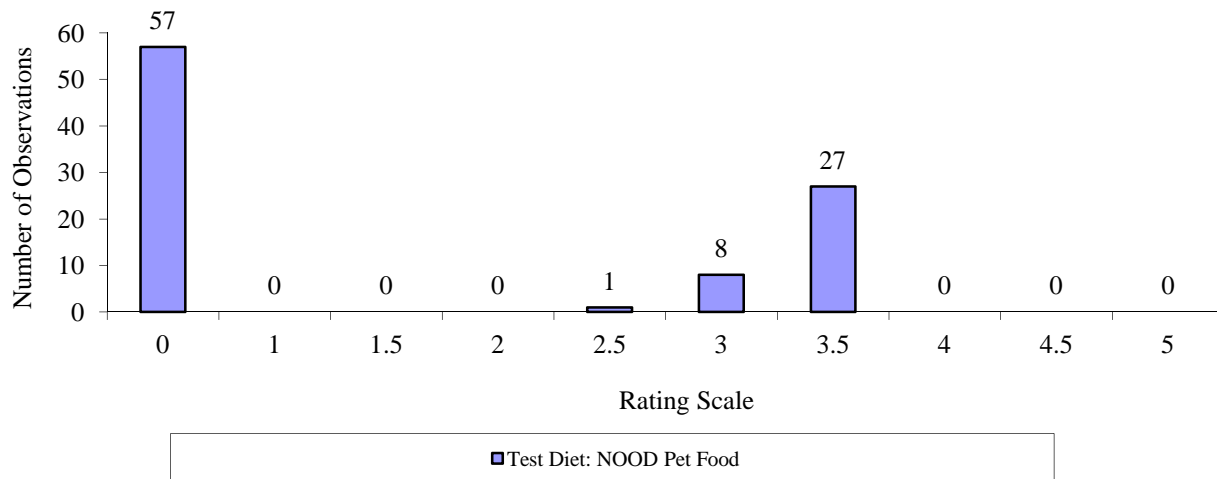
Date

**Summary**

Digestibility analysis was performed according to the recommended protocol for use in the determination of metabolizable energy of dog food as defined by Method 1 of the Association of American Feed Control Officials (AAFCO). The analysis results were as follows:

	<u>Mean</u>	<u>SEM</u>
Dry Matter (total) Digestibility -----	86.6	± 1.30
Protein Digestibility -----	87.2	± 1.09
Fat Digestibility -----	94.3	± 0.63
Caloric Digestibility -----	90.4	± 0.97
Metabolizable Energy (M.E.) kcal/g ----- (Using Atwater calculation)	3.80	± 0.041
Caloric Digestibility ----- (Using Bomb Calorimetry)	89.1	± 1.05
Metabolizable Energy (M.E.) kcal/g ----- (Using Bomb Calorimetry)	3.74	± 0.044

The following is a graph of the total fecal consistency observations:



0=none, 1=watery diarrhea; 1.5=diarrhea; 2=moist, no form; 2.5=moist, some form; 3=moist, formed; 3.5=well formed, sticky; 4=well formed; 4.5=hard, dry; 5=hard, dry, crumbly

### **Methods and Procedures**

The kennel facility is registered with the USDA (No. 23-R-0126) under the Animal Welfare Act. The kennel had a 12-hour-light/12-hour-dark cycle. Every attempt was made to keep temperature ranges within targeted conditions (from 50° to 85°F) in accordance with the Animal Welfare Act.

The purpose of the study was to assess the digestibility of test diet NOOD Pet Food. The Sponsor owns the study including raw data, results and final reports. Summit Ridge Farms agrees to keep all aspects of this study and report confidential. All data will be stored in Summit Ridge Farms archives for a five year period.

On 5/29/2019, 4-15.4 pound bags of test article NOOD Pet Food were received. Six Beagles identified by ear tattoo and cage numbers were placed on the study. The dogs were housed individually and presented with the test diet on an individual basis. Cages and bowls were cleaned daily and sanitized in accordance with the Animal Welfare Act.

Three (3) male and three (3) female dogs at least one (1) year of age, were placed on the test diet NOOD Pet Food for 10 days. The test diet was the sole source of food for the length of the test. The dogs were fed once daily at the same time each day. Body weights were recorded on Days 1 through 6, and on Day 10. The first five (5) days of the test were considered an acclimation period. Food consumption was recorded daily. Days 6 through 11 were fecal collection days. Stool quality observations were measured and recorded as according to a photo grading sheet a minimum of three (3) times daily during the collection period. A summary of body weights, food consumption, and grams of fecal output can be found in Tables 1 through 3 respectively. Fecal consistency observation ratings can be found in Table 8 with the frequency distribution in Graph 2. After the final fecal collection, each of six (6) individual fecal samples was sent to Eurofins US, Des Moines, Iowa, for analytical determination as appears in Table 4. A sample of test diet NOOD Pet Food was also analyzed and the results of the analyses can be found in Table 4.

The results of the analyses on the feces and the test diet were used to calculate dry matter, protein, caloric digestibility and metabolizable energy as presented in Table 5. Actual equations for the calculations are presented in Table 9. Comparison of metabolizable energy between proximate analysis method and digestibility trial method can be found in Tables 6 and 7.

**Parameters to be Measured**

Body weights (see Table 1):

- Daily during the acclimation period
- Day 1 of the collection period
- Final

Daily food consumption (see Table 2):

Fecal consistency observation ratings (see Table 8 and Graph 2):

- a minimum of three (3) times daily during the collection period for each dog

Fecal material excreted (see Table 3):

- Collected a minimum of three (3) times daily or as often as needed during the collection period to ensure a clean sample for each individual dog
- Weighed daily during the collection period for each individual dog

Disposition of fecal sample, sent to Eurofins US for laboratory analysis (see Table 4):

- moisture
- protein
- fat
- fiber
- ash
- calories

Food analyses, 500 grams of test diet NOOD Pet Food were used for analytical determination (see Table 4):

- moisture
- protein
- fat
- fiber
- ash
- phosphorus
- calcium
- calories

Five hundred grams of test diet NOOD Pet Food are being held until results are reviewed for submission.

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**Test Diet: NOOD Pet Food**

**Table 1: Body Weights (kg)**

Dog ID	Sex	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 10	Change	% Change
1562105	F	9.43	9.78	9.51	9.46	9.51	9.70	9.52	0.09	0.95 %
1562502	F	10.60	10.81	10.65	10.53	10.37	10.36	10.59	-0.01	-0.09 %
1484806	F	8.58	8.61	8.52	8.44	8.38	8.45	8.36	-0.22	-2.56 %
1450502	M	12.78	12.95	12.96	12.99	12.85	12.96	12.71	-0.07	-0.55 %
13172	M	11.92	11.97	11.90	11.92	11.87	11.90	11.87	-0.05	-0.42 %
12464	M	9.80	9.88	9.84	9.94	9.68	9.61	9.67	-0.13	-1.33 %
									Mean:	-0.07 -0.67 %
									SEM:	0.043 0.485 %

**Table 2: Daily Food Consumption (g)**

Dog ID	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 6 - 10 Total	
1562105	300	8	235	178	290	228	198	138	272	36	872	
1562502	300	290	290	290	300	310	310	310	310	310	1550	
1484806	203	83	128	93	173	233	120	143	96	221	813	
1450502	351	400	390	380	380	270	270	270	270	270	1350	
13172	200	200	200	200	200	200	200	200	200	200	1000	
12464	226	179	221	212	138	200	276	281	252	277	1286	
											Mean:	1145
											SEM:	120.0

**Table 3: Fecal Weights (g)**

Dog ID	Day 6	Day 7	Day 8	Day 9	Day 10	Total
1562105	191	94	58	147	22	512
1562502	228	117	131	115	112	703
1484806	180	58	95	46	119	498
1450502	91	139	61	90	84	465
13172	81	131	114	85	100	511
12464	25	37	104	115	76	357

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**Table 4: Diet and Fecal Analysis**

Test Diet	Dog ID						
	1562105	1562502	1484806	1450502	13172	12464	
MOISTURE%	7.10	74.13	72.00	74.61	73.03	73.95	69.59
FAT%	12.63	1.53	1.52	1.55	1.52	1.52	1.68
PROTEIN%	26.29	7.22	7.16	6.43	6.59	6.97	10.80
FIBER%	3.0	4.0	4.2	1.3	2.6	3.8	4.2
ASH%	6.56	5.55	5.83	5.46	6.10	5.55	5.86
PHOSPHORUS %	0.79						
CALCIUM%	1.15						
CAL/PHOS	1.46						
CALORIE (KCAL/G) (from calculation)	4.52	0.87	0.93	0.95	0.94	0.88	1.09
CALORIE (KCAL/G) (bomb calorimetry)	4.52	1.04	1.09	1.01	1.04	1.01	1.27

**Table 5: Calculations**

	Dog ID						Mean	SEM
	1562105	1562502	1484806	1450502	13172	12464		
DRY MATTER (TOTAL) DIGESTIBILITY (%)	83.6	86.3	83.3	90.0	85.7	90.9	86.6	± 1.30
PROTEIN DIGESTIBILITY (%)	83.9	87.6	85.0	91.4	86.5	88.6	87.2	± 1.09
FAT DIGESTIBILITY (%)	92.9	94.5	92.5	95.9	93.9	96.3	94.3	± 0.63
CALORIC a)DIGESTIBILITY (%)	88.7	90.6	87.1	92.9	90.1	93.3	90.4	± 0.97
METABOLIZABLE ENERGY a(M.E.) KCAL/G	3.73	3.80	3.65	3.89	3.78	3.92	3.80	± 0.041
CALORIC b)DIGESTIBILITY (%)	86.5	89.1	86.3	92.1	88.6	92.2	89.1	± 1.05
METABOLIZABLE ENERGY b(M.E.) KCAL/G	3.63	3.74	3.62	3.86	3.72	3.88	3.74	± 0.044

a) Values used to calculate these numbers were obtained using calculated gross energy

b) Values used to calculate these numbers were obtained from Bomb Calorimetry

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**Table 6: Digestibility Trial Method**

Dog ID	Gross Energy Food AF (kcal/g)	Food Intake AF (g)	Gross Energy Feces (kcal/g)	Fecal Output (g)	Protein Food AF (%)	Protein Feces (%)	Correction Factor Dog	ME (kcal/kg)
1562105	4.52	872	1.04	512	26.29	7.22	1.25	3634
1562502	4.52	1550	1.09	703	26.29	7.16	1.25	3738
1484806	4.52	813	1.01	498	26.29	6.43	1.25	3622
1450502	4.52	1350	1.04	465	26.29	6.59	1.25	3862
13172	4.52	1000	1.01	511	26.29	6.97	1.25	3720
12464	4.52	1286	1.27	357	26.29	10.80	1.25	3876

MEAN: 3742

**Table 7: Proximate Analysis Method**

	Crude Protein (%) AF	Crude Fat (%) AF	Crude Fiber (%) AF	Moisture (%) AF	Ash (%) AF	NFE (%) AF	Gross Energy (kcal/g)	ME (kcal/kg)
Test Diet: NOOD Pet Food	26.29	12.63	3.0	7.10	6.56	44.42	4.52	3548

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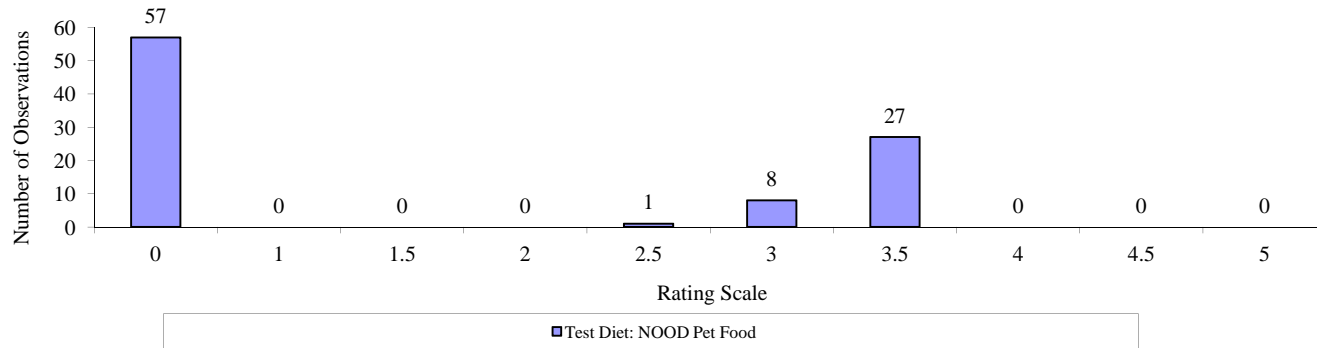
**Table 8: Fecal Consistency Observation Ratings**

Dog ID	Sex	Day 6			Day 7			Day 8			Day 9			Day 10			Day 11	
		PM	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM	AM	Midday		
1562105	F	0	3.5	3	0	3.5	0	0	3.5	0	0	3.5	0	0	3.5	0		
1562502	F	0	3,3.5	0	0	3.5	0	0	3.5	0	0	3.5	0	0	3.5	0		
1484806	F	0	3.5	3.5	0	3.5	0	0	3.5	0	0	3.5	0	0	3.5	0		
1450502	M	0	3.5	0	0	3.5	0	0	3.5	0	0	3.5	0	0	3.5	0		
13172	M	0	3	0	0	3.5	0	0	3	0	0	3,3.5	0	0	3.5	0		
12464	M	0	3	0	0	3.5	0	0	3.5	0	0	3.5	3	0	2.5,3	0		

RATING SCALE: Number of observations  
 0 = none 57  
 1 = watery diarrhea 0  
 1.5 = diarrhea 0  
 2 = moist, no form 0  
 2.5 = moist, some form 1

RATING SCALE: Number of observations  
 3 = moist, formed 8  
 3.5 = well formed, sticky 27  
 4 = well formed 0  
 4.5 = hard, dry 0  
 5 = hard, dry, crumbly 0

**Graph 2 -- Total Fecal Consistency Observation Ratings**





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Diet: NOOD Pet Food

### Table 9: Calculations

Dry Matter (Total) Digestibility =  $\frac{\{(Total\ Food\ Consumed) \times (\% \text{ Dry Matter of Food})\} - \{(Total\ Weight\ of\ Stool) \times (\% \text{ Dry Matter of Stool})\}}{\{(Total\ Food\ Consumed) \times (\% \text{ Dry Matter of Food})\}}$

Protein Digestibility =  $\frac{\{(Total\ Food\ Consumed) \times (\% \text{ Protein of Food})\} - \{(Total\ Weight\ of\ Stool) \times (\% \text{ Protein of Stool})\}}{\{(Total\ Food\ Consumed) \times (\% \text{ Protein of Food})\}}$

Fat Digestibility =  $\frac{\{(Total\ Food\ Consumed) \times (\% \text{ Fat of Food})\} - \{(Total\ Weight\ of\ Stool) \times (\% \text{ Fat of Stool})\}}{\{(Total\ Food\ Consumed) \times (\% \text{ Fat of Food})\}}$

Caloric Digestibility =  $\frac{\{(Total\ Food\ Consumed) \times (\text{Gross Energy per gram of diet})\} - \{(Total\ Weight\ of\ Stool) \times (\text{Gross Energy per gram of Stool})\}}{\{(Total\ Food\ Consumed) \times (\text{Gross Energy per gram of diet})\}}$

Metabolizable Energy (M.E.) =  $\frac{\{Gross\ Energy\ of\ Diet - Gross\ Energy\ of\ Stool - (Grams\ Protein\ Digested \times 1.25\ kcal/g)\}}{Amount\ of\ Food\ Consumed}$

Calculated Gross Energy =  $\frac{((9.4 \times \text{Fecal Fat}) + (5.65 \times \text{Fecal Protein}) + (4.15 \times \text{Fecal NFE}))}{10}$

Nitrogen-free Extract (NFE) =  $100 - (\% \text{ Crude Protein} + \% \text{ Crude Fat} + \% \text{ Crude Fiber} + \% \text{ Moisture} + \% \text{ Ash})$

Modified Atwater M.E. (kcal/kg) =  $10 \times \{(3.5 \times \text{Crude Protein}) + (8.5 \times \text{Crude Fat}) + (3.5 \times \text{NFE})\}$

Gross Energy (kcal/g) =  $\frac{\{(5.65 \times \text{Crude Protein}) + (4.15 \times \text{NFE}) + (9.4 \times \text{Crude Fat})\}}{100}$