

Moisture determination in pet food finished products: comparison of testing methods

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METHODS

KF: Karl Fischer method (with overnight MeOH extraction)

M1: Loss-on-drying (LOD) oven method at 135 °C, 2 hr

M2: Loss-on-drying (LOD) oven method at 104 °C, 3 hr

SAMPLES

Matrices: Dry Dog Food, Dry Cat Food, Wet Dog Food, Wet Cat Food

Manufacturers: 3 different manufacturers for each matrix

Determinations: Each sample run in triplicate

Total: 12 samples, 108 determinations (3 methods)

Table 1. Comparison of loss-on-drying (LOD) oven methods with Karl Fischer method in pet foods

Pet food type	Vendor	Moisture, %						
		Karl Fischer	Oven Methods					
		Mean	135°C, 2 h			104°C, 3 h		
		Mean	% Recovery ^c	Bias ^b	Mean	% Recovery ^c	Bias ^b	
Dry Dog Food	A	6.87 ^a	7.08 ^a	103.1	0.21	6.84 ^a	99.6	-0.03
	B	8.47	8.99	106.2	0.52	8.84	104.4	0.37
	C	10.32 ^a	10.43	101.1	0.11	10.30 ^a	99.8	-0.02
Dry Cat Food	A	5.58	6.44	115.4	0.86	5.98	107.2	0.40
	B	7.06	7.36	104.2	0.30	7.21	102.1	0.15
	C	8.83 ^a	9.06	102.6	0.23	8.77 ^a	99.3	-0.06
Wet Dog Food	A	76.40	76.13	99.7	-0.27	76.17	99.7	-0.23
	B	81.10	80.47	99.2	-0.63	80.43	99.2	-0.67
	C	74.37 ^a	74.33 ^a	100.0	-0.03	74.27 ^a	99.9	-0.10
Wet Cat Food	A	81.43 ^a	81.33 ^a	99.9	-0.10	81.30 ^a	99.8	-0.13
	B	79.53 ^a	79.47 ^a	99.9	-0.06	79.23 ^a	99.6	-0.30
	C	76.50 ^a	76.37 ^a	99.8	-0.13	76.30 ^a	99.7	-0.20

^a Means within a sample with the same superscript letter are not statistically different ($P > 0.05$) from the Karl Fischer mean

^b Bias is each LOD moisture method minus Karl Fischer^c Recovery as a percent of Karl Fischer Moisture

Figure 1. Mean % recovery for oven methods based on Karl Fischer

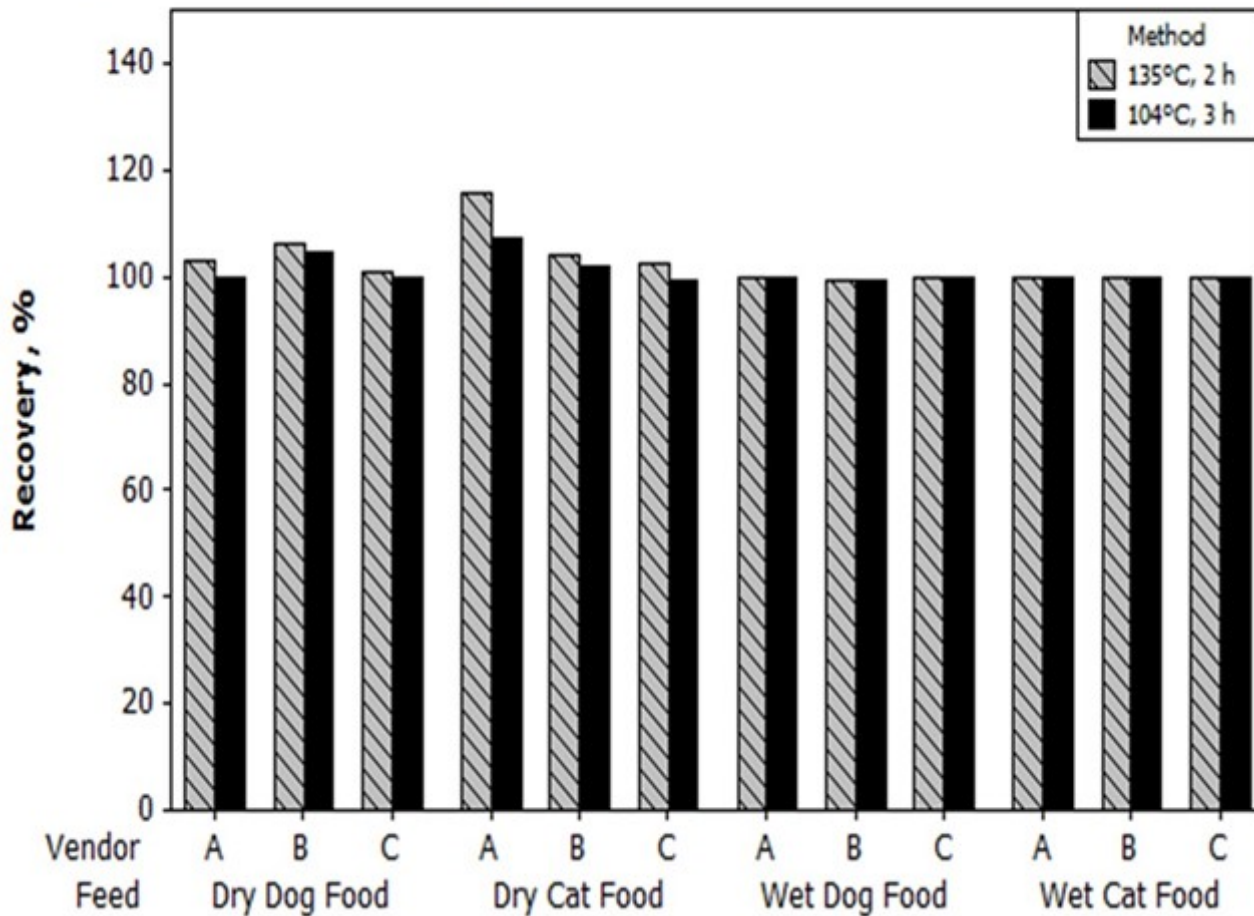
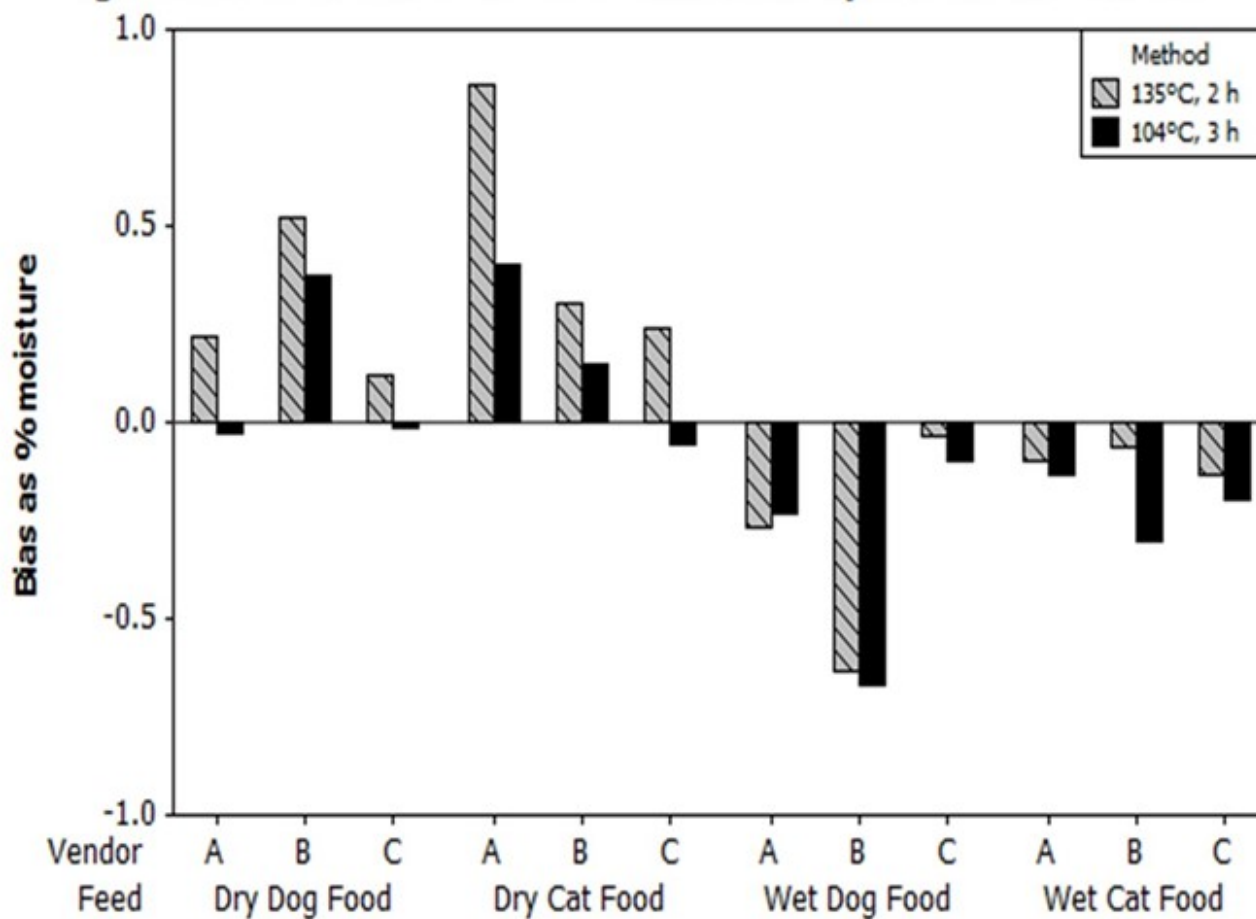


Figure 2. Moisture bias for oven methods compared to Karl Fischer



CONCLUSIONS

- Results generated by the oven method M2 (104 °C, 3 h) are more similar to the results generated by the Karl Fischer method than the results obtained by the M1 method (135 °C, 2 h).
- There is a good agreement between the two oven methods for wet pet food.
- There are slight differences detected between the oven methods and Karl Fischer method for two of the six wet pet foods analyzed.

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