

# Variation in the carbohydrate composition of dog food

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Dog and kennel owners consider that there are some dog foods which are more likely to cause diarrhoea in their dogs than other products. As a first stage in examining the reason behind this observation a range of dog foods was purchased from local supermarkets and analysed with particular emphasis on their carbohydrate composition. Both tinned and dry foods were selected in order to cover a broad price range.

All samples were dried to constant weight at 70°C before grinding through a 1 mm screen before further analysis. Crude protein (N x 6.25) was determined using a LECO N analyser, fat was determined using Soxhlet extraction and carbohydrate analysis using the procedure of Choct *et al.* (1993).

The cost of foods (\$/kg dry matter) varied from \$0.80 to \$16.70 per kg with tinned foods being the most expensive. In a regression of insoluble non-starch polysaccharides (NSP) and \$/kg DM, around 70% of the variation ( $r^2 = 0.71$ ) in price was explained by the fibre content irrespective of whether it was tinned or dry. There were several products which were conspicuously above or below the regression line. The clearest difference between dry and tinned samples was in the relationship between price and soluble NSP content. This analysis established two completely different relationships for tinned and dry foods. In both cases there was a good negative correlation between price and soluble NSP content but with the tinned

material having higher levels of NSP and being more expensive than the dry foods on this criterion. In nine out of the 11 samples there was a good relationship between fat and protein content. Of the other two, one had a much higher level of fat than expected and the other a lower fat content. Except for one product, the ratio of soluble to insoluble NSP was in the range 0.1 to 0.4 and was related to the total starch content. Two samples had very high levels of free sugars relative to total sugars and this suggests that sugars were added specifically as sweeteners as they constituted 5 to 6% of dry matter.

It appears that, irrespective of whether the food is tinned or dry, the main factors determining price of dog foods are the amount and nature of carbohydrate included in the formulation. In subsequent experiments we will examine the hypothesis that those foods containing high levels of NSP will support rapid fermentation in the hind gut and are more likely to produce stools of high water content through the role of fermentation end products in development of 'osmotic' diarrhoea.

## Reference

- Choct, M., Tribble, R.P. and Annison, G. (1993). A steam-lined procedure for determination of non-starch polysaccharides and starch. Proceedings of XV International Congress of Nutrition, Adelaide, Australia. p 569.

**Table 1** Composition of 7 dry (D1-D7) and 4 tinned dog foods (T1-T4) on a dry matter basis (g/kg DM). NSP, non-starch polysaccharides.

	Dry matter	Crude protein	Fat	Starch	Free sugars	Soluble NSP	Insoluble NSP	NSP ratio Sol/insol	Total sugars
D1	925	190	72	454	21	12	106	0.11	156
D2	833	156	59	445	64	11	83	0.13	176
D3	927	173	64	526	17	12	78	0.15	121
D4	927	212	73	440	18	12	103	0.11	149
D5	923	172	68	466	19	13	114	0.11	165
D6	936	275	55	297	19	13	85	0.16	132
D7	936	194	82	332	57	13	127	0.10	222
T1	184	427	385	20	4	14	11	1.27	32
T2	166	419	224	75	22	20	53	0.38	106
T3	206	324	142	211	26	30	76	0.39	150
T4	202	370	195	58	33	33	118	0.28	206