



Evaluation of quality and acceptability of pet pasta with buffalo tripe powder[#]

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Abstract

The study was undertaken with the objective of optimizing the level of tripe powder in the formulary of pet pasta. Two levels of tripe powder viz., 2.5 per cent (T_1) and five per cent (T_2) were added in the control formulation replacing the cereal flour mix. The samples were subjected to proximate analysis, palatability/acceptability assessment test and preference test. The moisture, dry matter, crude fiber and total ash contents did not vary significantly between the treatments. T_2 had significantly ($p<0.01$) higher crude protein, crude fat and energy content and significantly ($p<0.01$) lower carbohydrate content among the samples. T_2 had high palatability scores when compared to other samples. The intake ratio analysis showed that T_2 had significantly ($p<0.05$) higher intake per cent than T_1 and control ($p<0.01$) and was thus selected as the best formulation. T_2 with 6.54 ± 0.24 per cent moisture, 10.44 ± 0.50 per cent fat, 16.46 ± 0.60 per cent protein, 64.71 ± 0.73 per cent carbohydrate and energy value 418.63 ± 2.64 Kcal/100g could be categorised as dry type pet food based on NRC recommendations (2006).

Keywords: Buffalo tripe, acceptability, pet pasta

The bond between dogs and their guardians has been gradually increasing in the recent days. Today, pets are regarded as family members. Humanisation of pets has resulted in a competition between the pet food system and the human food system. Pet food creates a huge market for slaughter house offals which are secondary products of the human food system. Tripe is an important edible byproduct which is underutilized due to off-odour and poor microbiological characteristics. Tripe constitutes about 1.3 per cent of the slaughter weight of the buffalo. Tripe is a rich source of protein (Anandh, 2012). Incorporation of tripe in pet food would improve the

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nutrient composition of pet pasta and reduce economic losses on account of improper utilization besides stalling the negative impact on the environment due to improper disposal of slaughter house byproducts. Hence the present study was undertaken to evaluate the effect of addition of tripe in the pasta formulation and consequent palatability of the product and its acceptability by pet dogs.

Materials and methods

Standardisation and formulation

The control formulation (C) was standardised using cereal flours and other additives like egg, gelatin, guar gum and wheat gluten. Based on the experimental design two levels of tripe powder viz., 2.5 per cent (T_1) and five per cent (T_2) were added to the control pet pasta formulation replacing the cereal flour mix. The composition is given in Table 1.

Preparation of pet pasta

The ingredients were weighed and mixed in the planetary mixer (ITALYA Mixer, Model: VFM10A, India) for 15 minutes till the ingredients got mixed homogeneously, after which the mixture was then transferred to the pasta extruder (Dolly GB, Italy), water was added, the mass was kneaded for 15 minutes and extruded. These extruded pasta was then dried in a hot air oven at 70°C for two hours. The dried pasta was cooled to room temperature and packed in PE/Al/PA laminated standing pouches and sealed using Sepack Continuous

sealer (Sevana, Cochin, India) and stored at ambient temperature. On the day of the feeding trial, the pasta was cooked in boiling water (500 mL water for 100 gm pasta) for 12 min and fed to dogs.

Nutrient composition

The proximate composition of the pet pasta was determined by the standard procedure of AOAC (2016).

Palatability/acceptability assessment

Palatability assessment and the preference test were conducted in fifteen dogs housed under similar management practices as per the procedure described by Pame *et al.* (2017). The pet pasta was fed to the dogs at 3-5 hours after normal feeding time. The reaction of the dog towards the pasta was observed. Observation was made giving emphasis on the dog's approach to pet pasta, interest to eat and nature while eating. The opinion of the dog owner regarding the odour, colour and appearance of the pasta was also recorded on the same score card.

Preference Test

The dogs were simultaneously offered free access to two pans (A and B) each containing different treatments of the pet pasta along with a pan of drinking water. The total food consumed from each pan was measured after a timed interval. At each successive meal, the position of the food pans was alternated within

Table 1. Pet pasta mix formulation

Sl. No.	Ingredients (in %)	Control	T_1	T_2
1	Cereal flour mix	74	71.5	69
2	Whole egg	15	15	15
3	Plasma	2.5	2.5	2.5
4	Fat	3	3	3
5	Salt	0.5	0.5	0.5
6	Dicalcium phosphate	1	1	1
7	Paprika Oleoresin	0.9	0.9	0.9
8	Potassium Sorbate	0.2	0.2	0.2
9	Gelatin	2	2	2
10	Wheat gluten	0.4	0.4	0.4
11	Guar gum	0.5	0.5	0.5
12	Tripe	Nil	2.5	5

Table 2. Effect of different levels of buffalo tripe powder on the proximate composition of pet pasta

Parameters	C	T ₁	T ₂	F-Value	p-Value
Moisture (%)	7.61±0.38	6.73±0.50	6.54±0.24	2.118 ^{NS}	0.137
Dry matter (%)	92.39±0.38	93.27±0.50	93.46±0.24	2.118 ^{NS}	0.137
Crude protein (%)	11.82±0.69 ^c	14.18±0.24 ^b	16.46±0.60 ^a	18.18 ^{**}	0.000
Fat (%)	8.07±0.40 ^b	8.03±0.48 ^b	10.44±0.50 ^a	9.044 ^{**}	0.001
Crude fiber (%)	1.09±0.12	0.95±0.04	0.94±0.1	0.787 ^{NS}	0.468
Total ash (%)	1.91±0.03	1.93±0.04	1.85±0.01	2.221 ^{NS}	0.133
Carbohydrate (%)	70.59±0.89 ^a	69.12±0.70 ^a	64.71±0.73 ^b	15.464 ^{**}	0.000
NFE (%)	68.17±0.71 ^a	63.77±0.73 ^b	67.15±0.66 ^a	15.215 ^{**}	0.000
Energy value (Kcal/100 g)	402.26±2.53 ^b	405.51±2.02 ^b	418.63±2.64 ^a	12.915 ^{**}	0.000

^{**}significant at 1% level, ^{NS}- non significant. Mean with same superscripts in a row does not differ significantly. The values are expressed as Mean±Standard error. (Number of observations=8), C- Control (Pet pasta without tripe powder), T₁ - Treatment – 1 (Pet pasta with 2.5% tripe powder), T₂ - Treatment – 2 (Pet pasta with 5% tripe powder)

Table 3. Palatability score for pet pasta incorporated with different levels of tripe powder

Pet pasta samples	Attributes	High (%)	Medium (%)	Low (%)
Control C	Colour & Appearance	64.6	35.4	0.0
	Odour	0.0	100	0.0
	Approach	6.2	66.2	27.7
	Interest to eat	7.7	55.4	36.9
	Nature of eating (gulping)	21.5	44.6	33.8
	Preference	4.6	40.0	55.4
Treatment T₁	Colour & Appearance	64.6	35.4	0.0
	Odour	0.0	100	0.0
	Approach	26.2	60.0	13.8
	Interest to eat	21.5	56.9	21.5
	Nature of eating (gulping)	50.8	32.3	16.9
	Preference	18.5	56.9	24.6
Treatment T₂	Colour & Appearance	64.6	35.4	0.0
	Odour	0.0	100	0.0
	Approach	32.3	50.3	17.4
	Interest to eat	30.3	44.1	25.6
	Nature of eating (gulping)	48.2	29.7	22.1
	Preference	28.2	37.4	34.4

C – Control (Pet pasta without tripe powder), T₁ – Treatment- 1 and T₂ – Treatment - 2

the animal's enclosure to cancel any bias for a favored or habitual eating location. The total pasta left over from each pan was weighed 30 minutes after start of the feeding trial.

For expressing the preference results, the intake ratio (IR), which is a bias free method, was followed. $IR = A/(A+B)$, where A and B are the pet pasta consumption of two different pet

pasta of an individual animal. A ratio of >0.50 would indicate that the animal had consumed more food of 'A' than that of 'B'. A ratio of <0.50 would indicate that more of the food 'B' was consumed when compared to food A and a ratio of 0.50 would indicate that equal amounts of food were consumed. The ratio was summarised for the group of test animals by taking the average IR.

Results and discussion

Proximate composition

The effect of tripe powder in the proximate composition of pet pasta is shown in Table 2. For all the samples moisture content ranged between 6.54 ± 0.24 and 7.61 ± 0.38 per cent and the dry matter content ranged between 92.39 ± 0.38 and 93.46 ± 0.24 per cent. The moisture and dry matter content did not vary significantly between the treatments. Among the three formulations, C had significantly ($p < 0.01$) lower crude protein content and T_2 had significantly ($p < 0.01$) higher crude protein content. The increase in protein content was because of the higher protein content of the added tripe powder. Anurag (2012) observed that the crude protein content of buffalo tripe meal was 61.48 per cent. Abdolghafour *et al.* (2014) found a similar significant increase in protein level (17.85 per cent) in pet food developed using 50 per cent tripe meal. The fat content of C, T_1 and T_2 ranged between 8.03 ± 0.48 and 10.44 ± 0.50 per cent. Treatment T_2 had significantly ($p < 0.01$) higher crude fat content. The carbohydrate content ranged between 64.71 ± 0.73 and 70.59 ± 0.89 per cent and T_2 had significantly ($p < 0.01$) lower carbohydrate content. The crude fiber content ranged between 0.94 ± 0.1 and 1.09 ± 0.12 and total ash content ranged between 1.85 ± 0.01 to 1.91 ± 0.03 and there was no significant difference between the treatments and the control. NFE (Nitrogen Free Extract) content was significantly ($p < 0.01$) low in T_1 . T_2 with five per cent tripe powder had significantly ($p < 0.01$) higher energy content comparing the other treatments. The protein content of C and T_1 was lower than the NRC recommendations. The moisture, protein and fat content of T_2 met the recommendations of NRC, 2006 recommendations of a dry type pet food.

Palatability/ Acceptability

The palatability attributes of different levels of powdered tripe were studied with the help of score card in fifteen dogs housed under similar management practices. The score card comprised of two parts viz., the first part had the remarks of the dog owner while the second part contained the palatability attributes noticed

at the time of feeding. Attributes were classified into high, medium and low categories. The results obtained are showed in Table 3.

Control and treatments showed no variation in colour and odour and thus got similar scores. T_2 had high score for approach, interest to eat and preference. T_1 had the high score for nature of eating. The addition of tripe powder improved the palatability/acceptability scores.

Preference test

The intake ratio of C, T_1 and T_2 was measured using two pan palatability test as shown in Fig. 1. and the results were shown in Fig. 2. Intake ratio between T_1 and T_2 was compared initially and found that T_2 (0.55) had significantly ($p < 0.05$) higher intake level than T_1 (0.45). T_2 with high intake ratio was then compared with control and T_2 had significantly ($p < 0.01$) higher intake level than control. The T_2 with five per cent tripe powder was highly preferred by dogs and was selected as best formulation. Similar improvement in pet food palatability and acceptability was reported by Dust *et al.* (2005) when using animal protein source in pet food, Karthik *et al.* (2010) in spent-hen based pet food, Abdolghafour *et al.* (2014) in pet pasta developed with 50 per cent tripe meal and Pame *et al.* (2017) in pet pasta developed with meat cum bone meal and rendered fat.



Conclusion

The inclusion of tripe powder at five per cent level significantly improved the intake and nutrient qualities of the pet pasta.

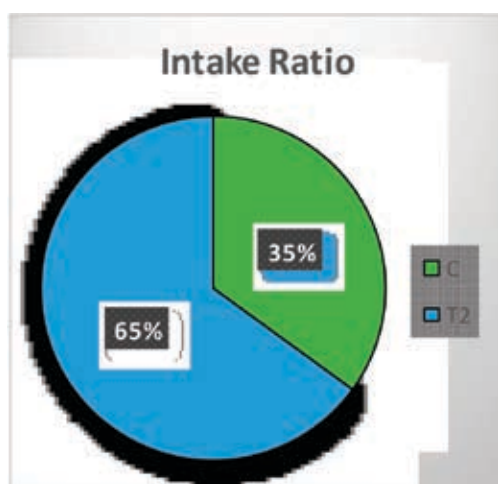


Fig. 1. Palatability/acceptability assessment

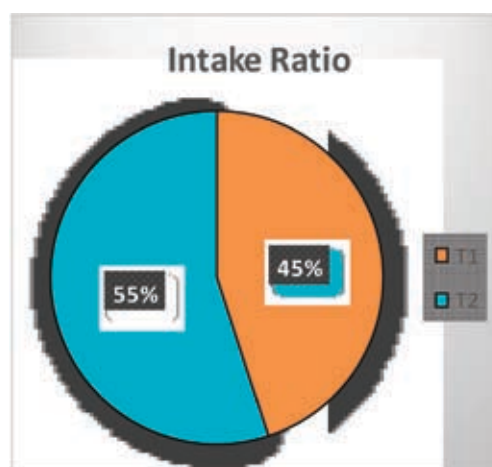


Fig. 2. Effect of various levels of tripe powder on the intake ratio of pet pasta in dogs

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Conflict of interest

The authors declare that they have no conflict of interest.

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