

NUTRITIONAL AND MANAGEMENTAL PRACTICES FOLLOWED BY DOG OWNERS IN BARNALA AND MANSA DISTRICT OF PUNJAB

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ABSTRACT

A survey was conducted to study nutritional and managerial practices followed by dog owners in Barnala and Mansa districts of Punjab state. For this, sixty (30 from urban and 30 from rural) and sixty two (30 from urban and 32 from rural) dog owners in Barnala and Mansa districts, respectively, were surveyed. Percentage usage of food items fed to dogs such as milk, milk product, curd, dal, vegetables, meat, bone and egg were more in Mansa than Barnala district. In urban Barnala, the quantity of dal, meat, bone, eggs offered to the pet dogs was higher ($P < 0.05$) whereas in urban Mansa, the quantity of the curd and chapatti offered to the pet dogs was higher ($P < 0.05$) than that offered in the rural areas of Barnala and Mansa. Homemade food was preferred (72.6%) in Barnala district; however, mixed food (52.7%) was the choice of Mansa district. Based on the data available, it is clearly indicated that feeding practices followed by the dog owners in rural and urban areas of Barnala and Mansa districts of Punjab closely followed the trend of food consumed by the dog owners and no scientific feeding schedules are being followed.

Keywords: Barnala, Dogs, Feeding practices, Mansa, Survey

The dogs being first animal to be tamed and their long association with human led to acclimatization of dogs to survive on human foods. Dogs share some specific carnivorous traits with cats as both lack salivary amylase, have a short gastrointestinal tract and are unable to synthesize vitamin D. A human and pet relationship exists parallel and the pet owners want to provide their dogs and cats with alternative foods, such as commercially available, “natural”, raw food and vegetarian diets as they are considered as family members (Michel, 2006). In Punjab, total dog population is 4,70,558, out of which in rural areas is 3,89,831 and in urban areas is 80,727 (Livestock Census, 2012). Pet dog owners usually feed their dog as per their convenience and the food items mainly include the leftovers of homemade cooked food which are nutritionally imbalanced with respect to protein, energy and minerals especially calcium and phosphorus (Shakhar *et al.*, 2010). The most common deficiencies encountered are in calcium levels, micronutrients such as zinc, copper, choline, vitamin D and vitamin E levels (Stockman *et al.*, 2013). Currently, no data have been available regarding the nutritional and managerial practices adopted by dog owners in Barnala and Mansa districts of Punjab. Therefore, this study was planned with the objective to determine the nutritional and managerial practices adopted by dog owners.

MATERIALS AND METHODS

To fulfill the objective of the study, the present investigation was carried out to study the different feeding practices adopted by dog owners in Barnala and Mansa district.

Survey proforma

A sample survey proforma was designed and pretested by conducting survey after thorough deliberations after which a well designed questionnaire was prepared. This survey proforma includes the queries regarding the feeding practices followed by the dog owners such as kind of feed, quantity and number of times in a day feed offered to dogs which include both vegetarian and non-vegetarian feedstuffs. Either these are fed raw or cooked. Besides this, some managerial and health aspect like cleanliness practices, vaccinations, deworming were also made part of this survey proforma. The survey was conducted in Barnala and Mansa districts of Punjab.

Selection of dog owners

A total of 122 dog owners were surveyed from Barnala and Mansa district of Punjab. The survey was conducted by visiting dog owner's houses, district polyclinics and private veterinary clinics. Data from both the districts were uploaded and coded for analysis. Statistical analyses were performed by use of SAS (2011) software.

Source of food sample

The different dog food ingredients such as milk, chapatti, pulses, fruits, meat, eggs, vegetables etc. were collected from the owner at his/her location in an insulated container to maintain the freshness of food and were brought to the Department of Animal Nutrition. A total of 15 samples were collected from the owners of Barnala and Mansa districts of Punjab.

Analysis of Dog food samples

A complete diet was prepared according to their proportion in the diet of dog as offered by their owner. The

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complete diet was dried and converted to powder form and stored for analysis. The feed samples were analyzed for proximate composition (moisture, crude protein (CP), ether extract (EE), total ash (TA), acid insoluble ash (AIA), crude fiber (CF), minerals (calcium and phosphorus), physicochemical properties (pH, free fatty acids and peroxide value) and microbiological counts (total plate count and coliform count).

RESULTS AND DISCUSSION

The perusal of data (Table 1) with regards to milk, milk product, sweet and curd offered to rural dogs showed consumption of milk product was more ($P \leq 0.05$) in rural areas (815.60 g) of Mansa in contrast to rural areas (491.70 g) of Barnala district while no significant ($P \leq 0.05$) difference between Barnala and Mansa district was noticed in consumption of milk, sweet and curd. Average quantity of dal and vegetables offered to dog in rural areas (82.81 g and 54.38 g) of Mansa district was higher ($P \leq 0.05$) compared to rural areas of Barnala (14.00 g and 22.83 g) district. No significant ($P \leq 0.05$) difference in feeding of chapatti and rice were observed in rural areas of both the districts. As far as non-vegetarian diet, it was noticed that bone, egg and meat offered to dogs was more ($P \leq 0.05$) in rural areas (33.59 g, 1.94, 112.50 g) of Mansa district in comparison to rural areas (6.67 g, 0.27 and 13.33 g) Barnala district.

Analysis of the data of urban dogs (Table 1) of Barnala and Mansa districts indicates that the milk product and

curd consumption in urban areas (893.30 g and 184.16 ml) of Mansa district is higher ($P \leq 0.05$) than urban areas (533.30 g and 143.33 ml) of Barnala district. Whereas, no significant ($P \leq 0.05$) difference in feeding of milk and sweets had been observed in urban areas of both districts. Feeding of chapatti, rice, dal and vegetables by dog owners to their dogs showed non-significant ($P \leq 0.05$) differences in both the districts. As far as the consumption of non-vegetarian feed stuffs were concerned, it was observed that quantity of eggs, meat and bone offered to dogs, shows no significant ($P \leq 0.05$) difference between two districts.

After scrutinizing the data of urban and rural dogs (Table 1) of Mansa district, it was observed that the food items such as milk, milk product, sweet, shows non-significant ($P \leq 0.05$) difference in urban and rural areas of this district but curd intake is more ($P \leq 0.05$) in urban areas (184.20 g) in contrast to rural areas (103.10 g). Higher ($P \leq 0.05$) consumption of average number of chapattis by dogs was observed in urban areas (7.00) as compared to rural areas (5.16). Whereas, the quantity of dal offered by dog owners to their dog was more ($P \leq 0.05$) in rural areas (82.81g) in contrary to urban areas (45.00g) of Mansa district. For non vegetarian diet, it was noticed that more ($P \leq 0.05$) bones were offered by dogs owners in rural areas (33.59g) compared to urban (15.83g) areas.

The perusal of the data (Table 1) of urban dogs and

Table 1
Feeding Practices followed by dog owners in Barnala and Mansa Districts

Variable	Mansa		Barnala	
	Urban (30)	Rural (32)	Urban (30)	Rural (30)
Milk and milk products				
Milk (ml)	856.70 ± 100.90	871.90 ± 85.52	783.30 ± 99.38	878.30 ± 85.03
Milk product (g)	893.30 ^A ± 140.80	815.60 ^A ± 132.20	533.30 ^B ± 74.60	491.70 ^B ± 79.04
Curd (ml)	184.20 ^{xA} ± 32.11	103.10 ^y ± 21.88	143.33 ^B ± 30.93	193.30 ± 49.64
Sweet (g)	8.67 ± 2.71	4.06 ± 2.28	12.33 ± 3.06	13.00 ± 4.74
Cereals and pulses				
Chapatti (#)	7.00 ^x ± 0.59	5.16 ^y ± 0.42	7.23 ± 0.63	6.37 ± 0.61
Dal (g)	45.00 ^y ± 8.76	82.81 ^{xa} ± 13.58	44.37 ^x ± 14.04	14.00 ^{yb} ± 5.31
Rice (g)	13.33 ± 6.31	7.81 ± 4.55	10.00 ± 4.42	10.00 ± 5.57
Fruits and vegetables				
Vegetables (g)	39.33 ± 8.44	54.38 ^a ± 10.10	19.83 ± 5.98	22.83 ^b ± 9.13
Non- vegetarian				
Meat (g)	55.00 ± 18.93	112.50 ^a ± 25.70	54.67 ^x ± 13.82	13.33 ^{yb} ± 6.31
Bone (g)	15.83 ^y ± 4.87	33.59 ^{xa} ± 7.58	20.33 ^x ± 4.51	6.67 ^{yb} ± 3.16
Egg (QT)	1.47 ± 0.27	1.94 ^a ± 0.23	0.90 ^x ± 0.19	0.27 ^{yb} ± 0.12

Value in parenthesis represents number of respondents; Figures with different superscripts in a row differ significantly ($P \leq 0.05$)

- x,y depicts the significant difference in variable between urban and rural areas of same district.
- A,B depicts the significant difference in variable between urban areas of both district.
- a,b depicts the significant difference in variable between rural areas of both district.

rural dogs of Barnala district shows that there was no-significant ($P \leq 0.05$) differences with respect to milk, milk product, sweet and curd consumption between urban and rural areas of this district. Average quantity of dal offered to dog in urban areas (44.37g) was higher ($P \leq 0.05$) as compared to rural areas (14.00g). Non-significant ($P \leq 0.05$) difference in feeding of chapatti, rice and vegetable was observed in rural and urban areas. Regarding non vegetarian diet, it was noticed that consumption of meat, bone and egg is greater ($P \leq 0.05$) in urban areas (meat 54.67g, bone 20.33g, egg 0.90) with respect to rural areas (meat 13.33g, bone 6.67g, egg 0.27g) of Barnala district.

While scrutinizing the data, it was observed that, interestingly 72.4% (Figure 1) of population of Barnala and 47.3% of population of Mansa district of Punjab offer homemade feed to their dogs while not even a single owner is feeding exclusively commercial feed to their dog in these two districts. 27.4% dog owners of Barnala and 52.7% of Mansa district offered both homemade and commercial feed to their pets. Davis *et al.* (2007) also reported that 75% of the dogs were fed home-cooked dog food; 23% commercial dog food; 11.5% table scraps; 1.4% raw meat and 2.7% other diets. In Barnala district, 68.3% rural and 38.7% of urban population feed only vegetarian diet to their dogs. From the data, it is inferred that more homemade feeding in Barnala district is due to the preference of vegetarian diet. Seneviratne *et al.* (2016) in his survey also observed that 42% of the dogs were being fed homemade diets only while only commercial food accounts for 18% and both homemade and commercial diets were fed to 40% of dogs.

The dog food samples obtained from Barnala and Mansa districts were analyzed for various proximate principles (Table 2). Fifteen feed samples collected from urban and rural areas of both districts. During analysis of feed sample of Barnala district, it was found that 50% of feed samples were in range of 18-22% for protein content, however, 25% feed samples were having more than 22%

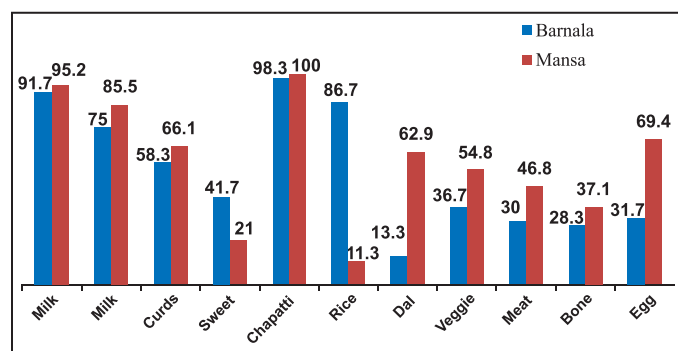


Fig. 1. Percent usage of Food items by dog owners of Barnala and Mansa District

protein and 25% feed sample were having less than 18% protein. Whereas, analysis of feed sample of Mansa district showed that 42.8% of feed samples were in range of 18-22% and 57.14% of feed sample having less than 18% protein. On an average, it can be ascertained that almost 70% food offered to dogs were meeting the crude protein requirement. Following fat analysis of feed sample, it was noticed that 100% of the feed samples were having more than 5% fat in both the districts. The fibre analysis showed that 62.5% of feed samples of Barnala district were having fiber less than 3.5% and 37.5% of samples were having fiber more than 6%. Whereas feed sample of Mansa district showed that 28.57% of feed sample were having fibre more than 6%, 42.85% having fibre 3.5- 6% and 28.6% having fibre less than 3.5%. As far as calcium and phosphorus is concerned, 62.5% sample of Barnala district were having more than 0.5% calcium and 37.5% having less than 0.5% calcium. 100% sample of Mansa district were having calcium less than 0.5%. 37.5% of samples were seen to have more than 0.3% phosphorus and 62.5% less than 0.3% phosphorus in Barnala district. Regarding Mansa district, it was noticed that 42.85% feed sample were having phosphorus more than 0.3% and 57.14% less than 0.3%.

The dog food samples collected from different areas of Barnala and Mansa were examined for physico-chemical (pH, Free Fatty Acids and Peroxide Value) and microbiological (Standard Plate Count, SPC and coliforms count) parameters (Table 3). The data of dog samples obtained from both the district revealed that, the pH value was less than 4 i.e. the samples were having acidic nature which may be due to the higher proportion of milk and milk products which when dried lead to acidic conditions. The level of Free fatty acids and peroxide value were below the prescribed limits which shows that there was no fat rancidity and good quality different food ingredients

Table 2

Chemical analysis of feed

Parameters	Percentage	Mansa (%)	Barnala (%)
Protein	<18	57.2	25
	18-22	42.8	50
	>22	0	25
Fat	<5	0	0
	>5	100	100
Fibre	<3.5	28.6	62.5
	3.5-6	42.8	0
	>6	28.6	37.5
Calcium	<0.5	100	37.5
	>0.5	0	62.5
Phosphorus	<0.3	42.8	62.5
	>0.3	57.2	37.5

Table 3

Physico-chemical properties of dog diet of Barnala and Mansa districts of Punjab

Parameter	Districts	
	Barnala	Mansa
pH	3.94±0.06	4.11±0.17
FFA(<2%)	0.11 ^b ±0.02	0.28 ^a ±0.05
PV(1-2)	0.39 ^b ±0.07	0.83 ^a ±0.11
SPC(<7 log 10cfu/gm)	2.52±0.10	2.62 ^{ab} ±0.09
Coliform(<3 log 10cfu/gm)	2.67±0.09	2.38±0.24

are being offered to dogs. The mean value of the microbiological parameters such as SPC and Coliforms were also well below the prescribed limits of the cooked dog foods. Since all the samples taken were fresh as owners offer fresh food to their dogs.

It is concluded that homemade diet feeding is preferred over readymade feed in both Barnala and Mansa districts. Chemical analysis showed that though 50% sample of Barnala district and 42.8% sample of Mansa district were meeting the protein requirement, a good balanced diet is required to meet the demand of the dogs, may be a special vegetarian diet meeting all the nutrient levels.

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