



Appraisal of Feeding Practices for Pet Dogs in Districts of Central Punjab

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Abstract

Under the present study, total 222 dog owners, eighty (46 from urban and 34 from rural), seventy-five (35 from urban and 40 from rural) and sixty-seven (34 from urban and 33 from rural) dog owners of the Amritsar, Tarn Taran and Jalandhar districts, respectively were surveyed. Data regarding the feeding practices were recorded and feed samples of dog feed were collected. Dog owners are mainly giving the homemade food. Consumption of milk and curd is significantly ($P \leq 0.05$) higher in both the urban and rural areas of Amritsar whereas milk product consumption is significantly lesser in urban area of Amritsar. Sweet consumption is highest recorded in urban area of Tarn Taran as compared to both areas of other districts. Non – vegetarian diet is highest in both urban and rural areas of Amritsar and Tarn Taran as compared to Jalandhar. Significant difference has been found in the milk, milk product, curd, chapatti, dal, rice and meat in urban and rural dogs in Amritsar district as compared to other two districts. The physiochemical properties of dog diet revealed that coliform and free fatty acid is found to be highest in Amritsar and lowest in Jalandhar. pH and standard plate count found to be non-significant among all the districts. Based on the data available, it is clearly indicated that there is wide variation in feeding practices adopted in various districts as well as rural and urban area of a district.

Keywords: Amritsar, Dog, Feeding Practices, Jalandhar, Tarn-Taran

Introduction

The association of human beings with dogs is well known since domestication and now dog keeping has status symbol. Pet owners have also been found to have higher levels of empathy for animals than people who do not live with pets (Remillard, 2008). Considering their high regard for animals, pet owners clearly want to feed diets that they consider healthy and beneficial for their companions' well-being (Case L, 2008). Selectiveness in choosing the pet and their feeding practices depends upon the knowledge and interest of dog lovers. Home-cooked diets are often fed due to the lower cost and poor availability of commercial diets. Milk has traditionally been a popular food given to dogs. Mostly vegetarian diet are given to dogs but it does not fulfil the requirements of all the nutrients including high quality proteins, vitamins, minerals and essential amino acid requirements. To complete and balance the diet of dogs, it should include the meat, fish, egg and their products. Most of the dog owners resort to unscientific management practices, because of convenience. Shakhari *et al.* (2010) carried out a survey covering 494 pet dogs revealed that most (~80%) of the dogs surveyed were reared on homemade diets with about 42% of the population receiving vegetarian diets. There was wide variation in the dietary composition of the homemade diets which comprised of varied combinations of bread, vegetables, meat and egg; however, milk was found to be an indispensable part of all the dietary combinations. Sawaimul *et al.* (2009) conducted a survey and reported that most of dog breeder (54%) housed the dog their homes and mostly provides them the mix (veg + non-veg) diet 2 to 3 times a day. Laflamme *et al.* (2008) conducted a survey on 637 dog owners and 469 cat owners in the United States and Australia regarding the feeding of pets. More than 90 per cent of pet dogs and cats were fed commercial foods for most of their diet, but non-commercial foods (such as table scraps, raw foods, and home-prepared diets) comprised at least 25percent of the diet for 17.3 percent of dogs and 6.3 percent of cats. Various dietary habits and trends are followed by dog owners in different regions of Punjab. Study regarding the prevalent feeding and management practiced followed by the pet owners as well as physio-chemical properties of dog diet in mentioned districts of Central Punjab is not available. Therefore, this study was conducted to evaluate the feeding practices followed by dog owners in Amritsar, Tarn Taran and Jalandhar districts of Central Punjab.

Materials and Method

The detailed methodology about the survey and data analysis is mentioned below-

Selection of Districts

The Central Punjab comprises the largest area with maximum number of districts including Patiala, Fatehgarh Sahib, Ludhiana, Moga, Jalandhar, Tarn-Taran and Amritsar. Data were collected from the Amritsar, Tarn Taran and Jalandhar districts. A sample survey was designed and survey performa was prepared by the expert committee. This survey performa includes the queries regarding the feeding and managerial practices followed by the dog owners such as breed, age, weight of dog, kinds of food (processed or non-processed) given, place of purchase of food provided, methods of cooking, foods of animal origin, raw or cooked, meat and animal byproducts, cleanliness practices, vaccinations, deworming, body score etc.

Selection of Dog Owners

Total 222 dog owners were selected randomly and surveyed from the three districts. Out of 115 urban dog owners, 46, 35 and 34 dogs were from the urban area of Amritsar, Tarn Taran and Jalandhar districts, respectively. Rest 107 dog owners, 34, 40 and 33dogs were from the rural areas of Amritsar, Tarn Taran and Jalandhar districts, respectively. The dog owners, visiting district polyclinics and private veterinary clinics were also included in the survey.

Estimation of Physiochemical Properties

The pH of dog food samples were determined as per the method described by Trout *et al.* (1992) with digital pH meter (FE-20-1-KIT, Mettler-Toledo India Pvt. Ltd., Mumbai) equipped with a combined glass electrode. Free fatty acid (FFA) and Peroxide value (PV) were estimated by the method of Koniecko (1979). Total Plate Counts (TPC), coliform counts and staphylococcus count of the samples were enumerated following the methods as described by American Public Health Association (APHA 1992).

Statistical Analysis

The data was analyzed using software package for social science (SPSS, 2011 version 20.0). The average values are reported along with standard error. The statistical significance was estimated at 5% level ($P < 0.05$) and evaluated with Duncan's Multiple Range Test (DMRT).

Results and Discussion

Feeding Practices Followed by Urban and Rural Dog Owners in Amritsar District of Punjab

Feeding practices adopted by urban and rural dog owners in Amritsar district is exhibited in Table 1. The perusal of the data shows that there was significant ($P < 0.05$) difference in the consumption of various parameters viz. milk, milk product, curd, chapatti, dal, rice and meat in urban and rural dogs in this district.

Table 1: Comparative feeding practices followed by rural and urban dog owners of the central Punjab

Food items	Rural			Urban		
	Amritsar	Tarn-Taran	Jalandhar	Amritsar	Tarn-Taran	Jalandhar
	(34)	(40)	(33)	(46)	(35)	(34)
Milk and milk products						
Milk (mL)	342.60 ^{ab} ±45.04	345.00 ^a ±39.34	295.50 ^b ±32.67	514.10 ^{aA} ±40.07	320.00 ^b ±28.71	297.10 ^b ±41.74
Milk product (g)	235.30 ^A ±44.69	199.80±41.21	204.54±45.37	67.39 ^{cB} ±28.04	211.40 ^a ±32.14	113.2 ^{bc} ±32.61
Curd (mL)	294.12 ^{ab} ±29.68	300.00 ^{aA} ±27.37	159.10 ^b ±30.13	430.40 ^{aA} ±51.09	172.10 ^{cB} ±24.27	213.20 ^b ±38.07
Sweet (g)	5.15±2.54	1.75 ^B ±2.35	3.63±2.59	3.80 ^b ±1.89	13.57 ^{aA} ±4.73	5.8 ^b ±2.80
Cereals and pulses						
Chapatti (Number)	3.26 ^{bb} ±0.36	4.18 ^{ab} ±0.33	3.33 ^{bA} ±0.37	5.13 ^{aA} ±0.26	3.77 ^b ±0.30	2.59 ^{cB} ±0.31
Dal (g)	30.74 ^B ±9.07	38.63±8.36	24.24±9.20	67.83 ^{aA} ±8.97	54.29 ^{ab} ±10.28	23.53 ^b ±10.43
Rice (g)	51.47 ^{ab} ±9.30	32.00 ^b ±8.56	24.24 ^b ±9.44	94.57 ^{aA} ±8.83	42.86 ^b ±10.13	22.06 ^c ±10.28
Fruits and vegetables						
Vegetables (g)	80.88 ^a ±11.48	63.00 ^a ±10.58	12.12 ^{bb} ±11.65	67.83 ^{ab} ±12.24	94.29 ^a ±14.45	43.82 ^{bA} ±14.24
Non-vegetarian						
Meat (g)	191.90 ^B ±30.11	200.00±27.76	157.60±30.57	346.70 ^{aA} ±47.20	174.30 ^b ±24.37	147.10 ^b ±27.03
Bone (g)	68.38 ^a ±18.32	63.13 ^a ±16.89	33.33 ^b ±18.60	68.48 ^a ±12.76	40.00 ^{ab} ±10.00	45.59 ^{ab} ±20.72
Egg (Number)	1.47±0.17	1.78±0.26	1.76±0.20	1.70±0.16	1.54±0.19	1.35±0.19

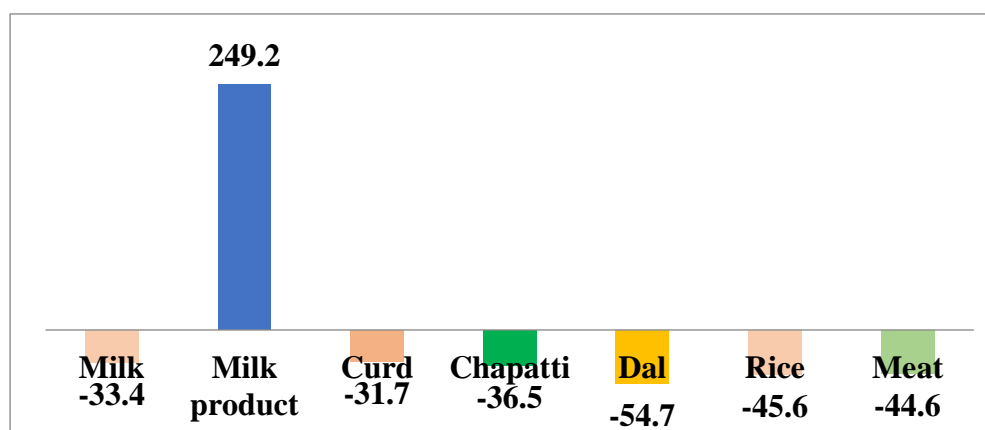


Figure 1: Percent difference in use of food items by rural dog owners of Amritsar district in comparison to urban dog owner.

The consumption of milk and curd was decreased ($P < 0.05$) in rural area by 33.4 percent and 31.7 percent

respectively (Fig. 1) in comparison to urban area dogs. The milk products offered to dogs were increased ($P \leq 0.05$) by 249.2% (Fig. 1) in the rural area (235.30 g) as compared to urban area (67.39) whereas non-significant difference was observed in consumption of sweet in urban and rural area. Among the cereals and pulses, number of chapatti, dal and rice offered was highest ($P \leq 0.05$) in urban areas as compared to rural areas. Veggie consumption was same ($P \leq 0.05$) in both urban and rural areas of Amritsar. As far as the consumption of non-vegetarian diet is concerned meat consumption was more ($P \leq 0.05$) in urban areas by 44.6% as compared to rural areas whereas non-significant differences were observed in consumption of bone and egg between rural and urban dog owners.

Feeding Practices Followed by Urban and Rural Dog Owners in Tarn-Taran district of Punjab

Feeding practices adopted by urban and rural dog owners in Tarn-Taran district is presented in Table 1. The study revealed that there was significant ($P \leq 0.05$) difference in consumption of curd and sweets among urban and rural areas. The curd consumption of dogs was more ($P \leq 0.05$) in rural area (300 mL as compared to urban area (172.10 ml) with an increase ($P \leq 0.05$) of 74.3% (Fig. 2) whereas sweet consumption was decreased ($P \leq 0.05$) by 87.1% in rural area (1.75 g) as compared to urban dog owners (13.57 g). Non-significant differences were observed in rest of the parameters between rural and urban dog owners.

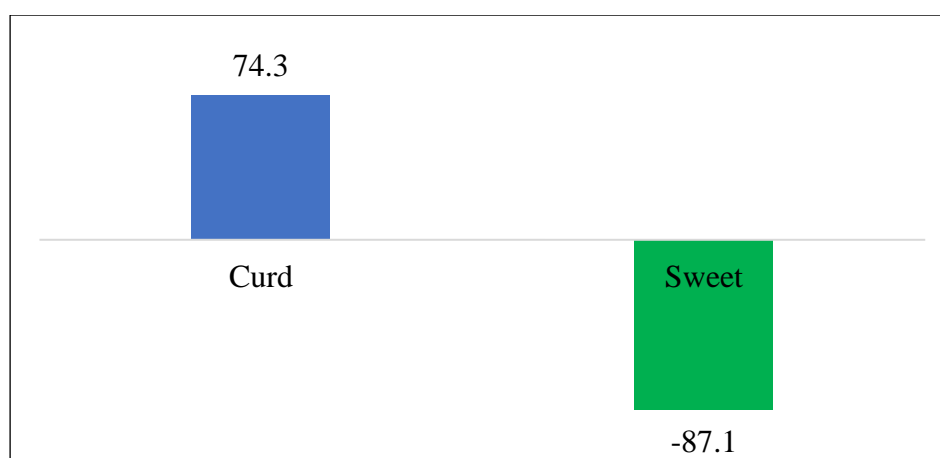


Figure 2: Percent difference in use of food items by rural dog owners of Tarn-Taran in comparison to urban dog owner.

Feeding Practices Followed by Urban and Rural Dog Owners in Jalandhar district of Punjab

Feeding practices adopted by urban and rural dog owners in Jalandhar district is exhibited in Table 1. Data regarding feeding practices revealed that there was significant ($P \leq 0.05$) difference in number of chapattis and veggies consumption in this district among urban and rural dog owners. The number of chapattis offered was more ($P \leq 0.05$) in rural area (3.33) as compared to urban dog owners (2.59) which showed an increase ($P \leq 0.05$) of 28.6% (Fig. 1); whereas veggie consumption declined ($P \leq 0.05$) in dogs of rural area (12.12 g) by 72.3% (Fig. 3) as compared to dogs of urban area (43.82 g). Rest of the variables studied during this survey showed non-significant differences between rural and urban dog owners.

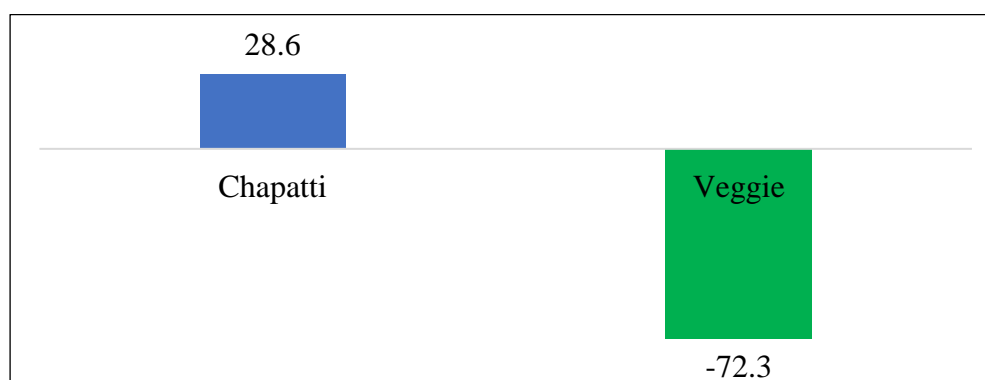


Figure 3: Percent difference in use of food items by rural dog owners of Jalandhar district in comparison to urban dog owner.

Comparative Feeding Practices Followed by Rural Dog Owners of the Different Districts

The perusal of the data of feeding trends of rural dogs of all the districts shows that milk, curd and bone consumption was significantly higher ($P \leq 0.05$) in Amritsar and Tarn Taran but lowest ($P \leq 0.05$) in Jalandhar (Table 1). There was no significant ($P \leq 0.05$) difference in consumption of milk product, sweet and dal in all the rural areas of different districts. Number of chapattis offered to dogs in rural areas was highest ($P \leq 0.05$) in Tarn Taran (4.18) and the lowest ($P \leq 0.05$) number of chapatti were fed by the rural areas of Amritsar (3.26) and Jalandhar (3.33). Rice feeding was maximum ($P \leq 0.05$) in Amritsar district followed by other districts. The consumption of veggies by dogs was found to be maximum ($P \leq 0.05$) in rural areas of Amritsar district and minimum ($P \leq 0.05$) in rural areas of Jalandhar district.

The consumption of non-vegetarian diets showed that non-significant ($P \leq 0.05$) difference was observed in meat and egg consumption between all the districts of central Punjab. As far as the consumption of bone is concerned, it was highest ($P \leq 0.05$) in Amritsar and lowest ($P \leq 0.05$) in Jalandhar district. Davis *et al.*, 2007 revealed that 75% of the dogs were fed home cooked food, 23 % commercial dog food, rest both. Shakhar *et al.* (2010) revealed that homemade diets constituted the mainstay of feeding pet dogs in India.

Comparative Feeding Practices Followed by Urban Dog Owners of the Central Punjab

Data regarding the feeding practices followed in the urban areas of different districts of central zone is presented in Table 1. The critical observation of the data showed that feeding of milk and curd in urban areas of the Amritsar (514.10ml, 430.40ml) district showed highest ($P \leq 0.05$) consumption. The consumption of milk products and sweet was significantly higher ($P \leq 0.05$) in Tarn Taran as compared to other districts. Number of chapattis, quantity of dal and rice offered to dog by urbanities of Amritsar was highest ($P \leq 0.05$). As far as the veggies consumption of dogs is concerned it was highest ($P \leq 0.05$) in Tarn-Taran (94.29 g) and lowest ($P \leq 0.05$) in Jalandhar (43.82 g) district. The consumption with respect to non-vegetarian diets showed that meat and bone consumption was maximum ($P \leq 0.05$) in Amritsar whereas it was minimum ($P \leq 0.05$) in other districts. Non-significant difference was observed in egg consumption between all the districts of central Punjab. Sakshi *et al* (2017) reported that 81.25 % of the respondents availed the information what type of food should be offered to dogs during different stages like sick/ill, balanced feeding and feeding supplementary ration.

Physio-Chemical Properties of Dog Diet of Different Districts

The dog food samples obtained from the districts of Central Punjab were analysed for various physio-chemical (pH, free fatty acids and Peroxide value) and microbiological (Standard Plate Count (SPC) and coliforms count) parameters (Table 2). Texture analysis of the dog diet was not performed as all the ingredients of the diet were mixed dried and powdered. The data of the dog food samples from all the districts of Central Punjab revealed that the pH value was less than 4 *i.e.* the samples were having acidic nature which was may be due to the higher proportion of milk and milk products which when dried lead to acidic conditions.

Table 2: Physio-chemical properties of dog diet of different districts

Parameters	Amritsar	Tarn-Taran	Jalandhar
	(7)	(7)	(8)
pH (7)	4.75±0.09	4.71±0.19	4.36±0.15
Free Fatty Acid (<2%)	0.33 ^a ±0.03	0.29 ^a ±0.03	0.18 ^b ±0.02
PV (1-2%)	0.86 ^{ab} ±0.14	0.58 ^b ±0.15	1.02 ^a ±0.17
SPC (<7 log ₁₀ cfu/gm)	2.39±0.07	2.53±0.09	2.56±0.11
Coliform (<3log ₁₀ cfu/gm)	1.09 ^a ±0.20	0.94 ^{ab} ±0.25	0.38 ^b ±0.25

Values in parenthesis represent number of respondents; Figures in each row with different superscripts differ significantly ($P \leq 0.05$)

Estimation of free fatty acids and peroxide value was performed to check the fat rancidity was very less which might be due to good quality of different food ingredients given to the dogs. The mean values of the microbiological parameters such as SPC and Coliforms were also well below the prescribed limits of the cooked dog foods. The results found by Fredriksson-Ahomaa *et al.* (2017) concluded that 28% of the RMBDs showed enteric pathogens and *Campylobacter* was the most frequent pathogen found in 15% of the RMBDs whereas all the samples were negative for *Campylobacter jejuni* and *Campylobacter coli*. *Salmonella* was detected in only 2% of the samples and,

surprisingly, *Y. pseudotuberculosis* was also detected in two samples. Since all the samples taken were fresh and analysed as such, aflatoxin presence was obviated. However, the commercial feed offered to dog owners showed aflatoxin below the prescribed limits.

Conclusion

It was concluded that there was significant ($P \leq 0.05$) difference in the consumption of various parameters viz. milk, milk product, curd, chapatti, dal, rice and meat in urban and rural dogs in Amritsar district. Significant ($P \leq 0.05$) differences were also observed in consumption of curd and sweets among urban and rural areas of Tarn Taran district. In Jalandhar district, there was significant ($P \leq 0.05$) difference in number of chapattis and veggies consumption among urban and rural dog owners. It is clearly indicated that feeding practices followed by the dog owners in these districts of Central Punjab vary from district to district.

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Conflict of Interests

There is no conflict of interest.

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