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Production and Evaluation of Okara Based Pet Foods for Dogs

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Abstract
Incorporating okara, a perishable by-product of soymilk preparation into dog food will not only add value to the seemingly useless by-product but reduce environmental pollution from soymilk producing industry. Freshly produced okara was steam heated under pressure (15 psi) for 15 minutes, then cooled to room temperature and used to formulate two pilot dog foods which were supplemented with fish (A) and meat (B) meals respectively. Proximate compositions of the foods were carried out following the standard methods and eight dogs of four different breeds (Rottweiler, Doberman pinscher, Bullmastiff, andKingsrot) were randomly selected from dog keepers and used for acceptability and hedonic scoring of the pilot foods. Dog food A was higher in crude protein and moisture content, while Food B had higher fibre, ether extract, ash content and nitrogen free axtract values. All the dogs accepted the foods at first presentation and degree of likeness was very good except for the Doberman breed, while diarrhoeic reaction was noticed only among the Bullmastiff. Therefore, okara has a good potential for incorporation into dog foods.

Keywords: Okara, soybean, pet food, dog

Introduction

In Nigeria, most dogs are traditionally fed on food scraps, food leftovers or food materials considered unfit for human consumption. Limited quantities of formulated dog foods are sold in choice supermarkets and pet shops, but these are largely imported and expensive. Hence, most keepers of exotic dogs are challenged by the high cost of feeding and maintaining their dogs. Meat and other food ingredients are rarely graded in Nigeria and hence, sourcing food materials at competitively low prices to justify investment in pet food manufacturehave, therefore, become a major challenge to the development pet food industry in Nigeria. One way to solve this problem will be to use the nutritious but inexpensive by-product of food processing such as Okara. Okara is a pulp consisting of insoluble parts of the soybean which remains after pureed soybeans are filtered in the production of soymilk. It is rich in digestible dietary fibre (50%), protein (25%), lipid (10%) and other nutrients (O' Toole, 1999) with at least one-third of the isoflavones present in the soybean (Bowles and Demiate, 2006; Jackson *et al*., 2001). Each tonne of processed soybeans yields two tonnes of okara (Grizzotto *et al*., 2010) and it is largely treated as a waste because it deteriorates rapidly and cannot be stored for a considerable period of time. Its high content of digestible fibre, protein and isoflavones imply that it will contribute to the overall gastrointestinal health of dogs and may help some dogs keep their weight down.

Therefore, incorporating okara into dog food will not only add value to the seemingly useless by-product but reduce environmental pollution from soymilk producing industry.

Materials and Methods

Freshly produced okara was steam heated under pressure (15 psi) for 15 minutes and then cooled to room temperature. Two pilot dog foods were formulated as shown in Table 1. The fish meal in Dog food (A) was replaced by meat meal in Dog food (B). Each diet was thoroughly mixed and then run through the pelleting machine. The pellets were then air dried and stored in airtight plastic containers until use. Proximate compositions of the foods were carried out following the standard methods as described by AOAC (1990).

Table 1: Ingredient composition of pilot dog foods

Ingredients (%)	Diet A	Diet B
Maize	40.00	40.00
Cassava Meal	12.00	12.00
Okara	34.00	34.00
Fish Meal	8.00	-
Dried Meat	-	8.00
Others*	8.00	8.00
Total	100.00	100

* Mixture containing wheat offal (2kg), bone meal (3kg), Lysine (250g), methionine (250g); Min. & Vit. Premix (250g) and iodized salt (250g)

8 dogs of four different breeds (Rottweiler, Doberman pinscher, Bullmastiff, andKingsrot) were randomly selected from dog keepers from FUTO community for acceptability and hedonic scoring of the pilot foods. The degree of acceptance was evaluated by the dog's readiness to consume at first presentation while hedonic rating (Degree of likeness) was also measured by the dog's willingness to consume the diet at repeat presentations The 5-point Hedonic rating scale was used. During this feeding trial, the dogs were monitored for possible clinical allergenic reactions such as nature and colour of faeces, skin reactions, etc.

Results and Discussion

The proximate compositions of pilot dog foods are shown in Table 2. Dog food A was higher in crude protein and moisture content while Food B had higher fibre, ether extract, ash content and NFE values. These values were however within the limits reported label values for most commercial dog food brands sold within the study area (Eluemuno, 2017) and recommended dietary nutrient allowance for dogs (NRC, 1974). The acceptance and hedonic rating are shown in Table 3. All the dogs accepted the foods at first presentation and degree of likeness was very good except for the Doberman breed and diarrhoeic reaction was noticed only among the Bullmastiff.

Table 2: Proximate composition of the trial diets

Parameters (%)	A	B
Moisture	5.50	4.95
Crude Protein	22.91	18.91
Crude Fat	9.85	10.82
Crude Fibre	1.21	1.40
Total Ash	7.05	7.49
Nitrogen Free Extract	53.48	56.43

NFE: Nitrogen Free Extract (Carbohydrate CHO), ARB: As Received Basis

Table 3: Acceptability and hedonic score of the pilot dog foods.

Breeds of Dog	Number	Acceptance	Hedonic	Allergic reactions
Doberman	1	4	3	3
Bullmastiff	3	5	4	1
Rottweiler	2	5	5	2
Kingsrot	2	5	5	5
Total	8	19	17	11

Five- point category rating (5 – Excellent, 4 – Very good, 3 – good, 2 – Modest, 1 - Reject), Allergic reaction (5 – None, 4 – Modest, 3 – Slightly soft, 2 – Soft, 1 – Diarrhoeic)

Conclusion

Based on the results obtained from this study, it is therefore concluded that okara has a good potential for incorporation into dog food. All the dogs fed the okara based pet food readily accepted it.

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