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Research Article

PHYSICOCHEMICAL STUDY OF PET FOOD DEVELOPED FROM BUFFALO MEAT BY- PRODUCTS

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ABSTRACT

The meat processing industries contain a lot of buffalo meat by-products as waste materials which create several health hazards and environmental pollution. India rank first in buffalo meat in the word. The by products of buffalo meat contain vitamins and minerals, which makes it functional and nutritional. Investigations were carried out to study the effect of incorporation of tripe meal and rice flour on development, quality evaluation and storage stability of pet food under ambient condition. The quality of pet food was based on physicochemical characteristics namely moisture, ash, fat, protein content, pH, The Analysis using paired sample t-test for optimization. There was moisture content (8.211%), Ash content (3.571%), protein (17.85%), pH (6.688) and fat in the range (14.323%). The analysis model was found significant for protein, pH, ash and were not significant for moisture and fat.

Keyword: Pet Food, Tripe meal, Rice flour, Bone meal, Paired sample t-test.

INTRODUCTION

Pet food is a very competitive business and it is an extension of the human food and agriculture based industry. As a large number of manufacturers have been marketing the pet food, it is utmost essential for the pet owners to seek the guidance of the veterinarians before a feed. Some pet food manufacturers instead of pet they attracted the pet owners by spending a lot of money on advertisements and promote the idea to keep pets healthy because their product is a complete and balanced diet. But the truth is that they produced their product by unregulated operations (Adamelli *et al.,* 2005). Pet food is a speciality food for domesticated animals that is formulated according to their nutritional needs. Pet food generally consists of meat, meat by-products, cereals, grain, vitamins, and minerals. In the U.S. about 300 manufacturers produce more than 7 million tons of pet food each year, one of the largest categories of any packaged food. Pet owners can choose from more than 3,000 different pet food products, including the dry, canned, and semi-moist types, as well as snacks such as biscuits, kibbles, and treats. In the 1990s, this $8-billion industry feeds America's 52 million dogs and 63 million cats. There are several types of pet food available for cats and dogs that include dry foods, wet foods, canned foods, moist foods, semi-moist foods, frozen-chilled pet foods, and treats (Kang and Kondo, 2002). Pet food is a collection of many inputs from many sources with one output, which goes into the home to be fed to the pet cat or dog (Thompson, 2008). Pet food generally consists of meat, meat by-products, cereals, grain, vitamins, and minerals. Dogs are carnivores and their digestive system is by 2/3 shorter than that of pigs. Therefore, the nutritive components have to be of high quality, rich in energy, and easy to digest, in particular the vegetable components (Buschhart and Lucht, 2008). The present contribution discussed the results of studies investigating the effects of extrusion processing on the physicochemical and microbiological quality of dry pet foods and provides recommendations for further studies to control the extrusion process variable in order to optimize the nutritional quality of dry pet foods. The following objectives were set for the accomplishment of the study. 1**.** To develop buffalo meat offal based pet food bybuffalomeat by- products. 2**.** To study the quality evaluation of samples.

MATERIALS AND METHOD

The present study was undertaken for quality evaluation of pet food developed from buffalo meat by-products. The quality of pet food was evaluated on the basis of physical-chemical characteristics, namely pH, moisture content, protein content, ash content and fat content. The study the composition of the pet food was optimized using Analysis of paired sample t-test.

Experimental design:

The independent variables (factors) in the present study were tripe meal and rice flour. The levels of these factors were generated by applying statically analysis with the help of Paired t-test. The Paired t-test

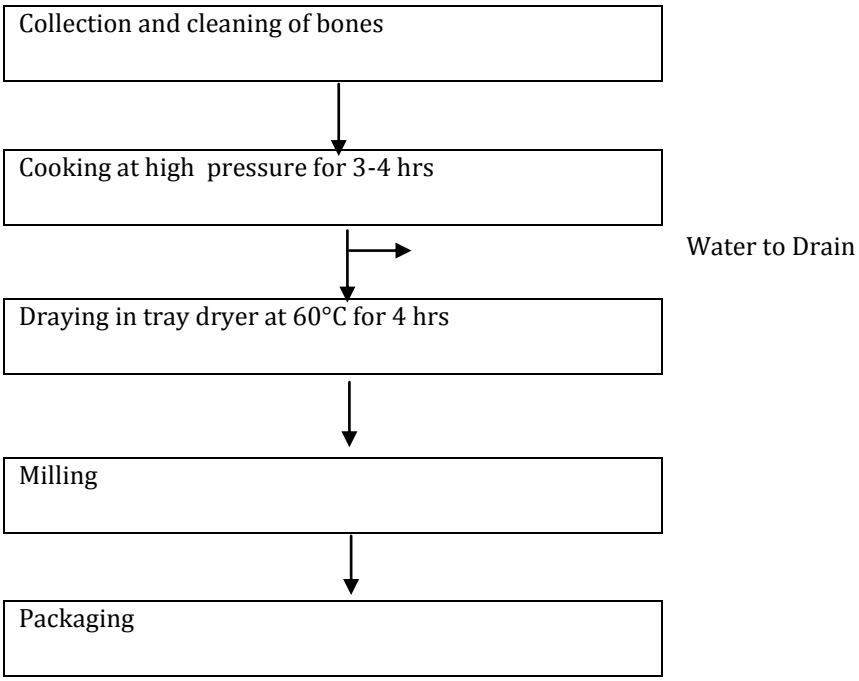
suits for fitting quadratic surface, which usually works well for optimization composition. Development of pet food and quality analysis was conducted in the Department of Post Harvest Engineering and Technology, Faculty of Agricultural Sciences, A.M.U. Aligarh.

Composition of samples:

The compositions of pet food were Tripe meal 50%, Rice flour 45%, Bone meal 2%, and Guar gum 2.5%, Potassium sorbate 0.5%.

Preparation of bone meal:

Sterilized bone meal a good source of phosphate supplement in livestock feed. Bone meal should be less than 2 mm size. Yield of bone meal was 35% of raw bones. Quality of bone meal is determined by the presence of phosphorous and calcium that should ideally be present in the ratio of 1:2, The average composition of bone meal is- Calcium-30.5%, Phosphorous-15.5%, Protein-7%, Fat-1%. Flow chart 1 shows the preparation of bone meal.

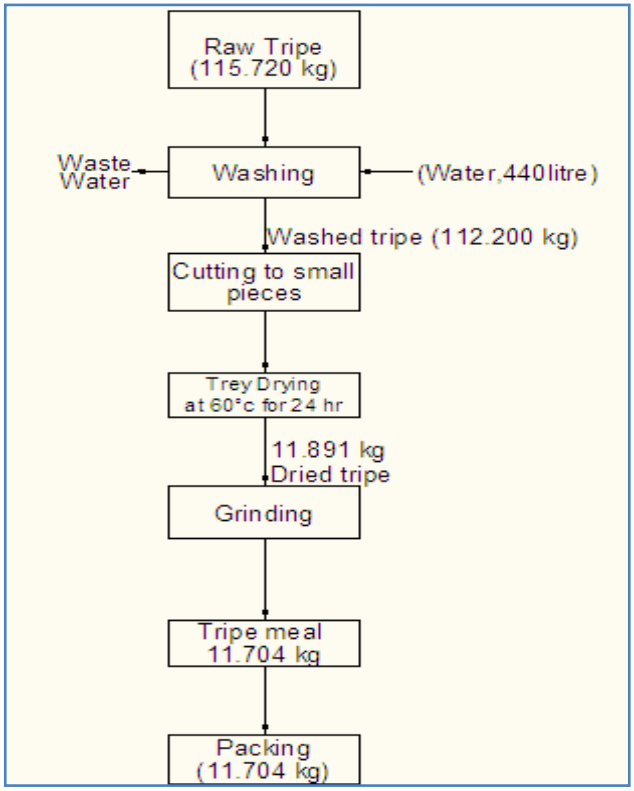


Flow Chart 1: Process Flow chart for making bone meal

Preparation of tripe meal:

Buffalo tripe is usually made from only the first three chambers of a buffalo's stomach: the rumen (blanket/flat/smooth tripe), the reticulum (honeycomb and pocket tripe), and the omasum (book/bible/leaf tripe). Abomasum (reed) tripe is seen much less frequently, owing to its

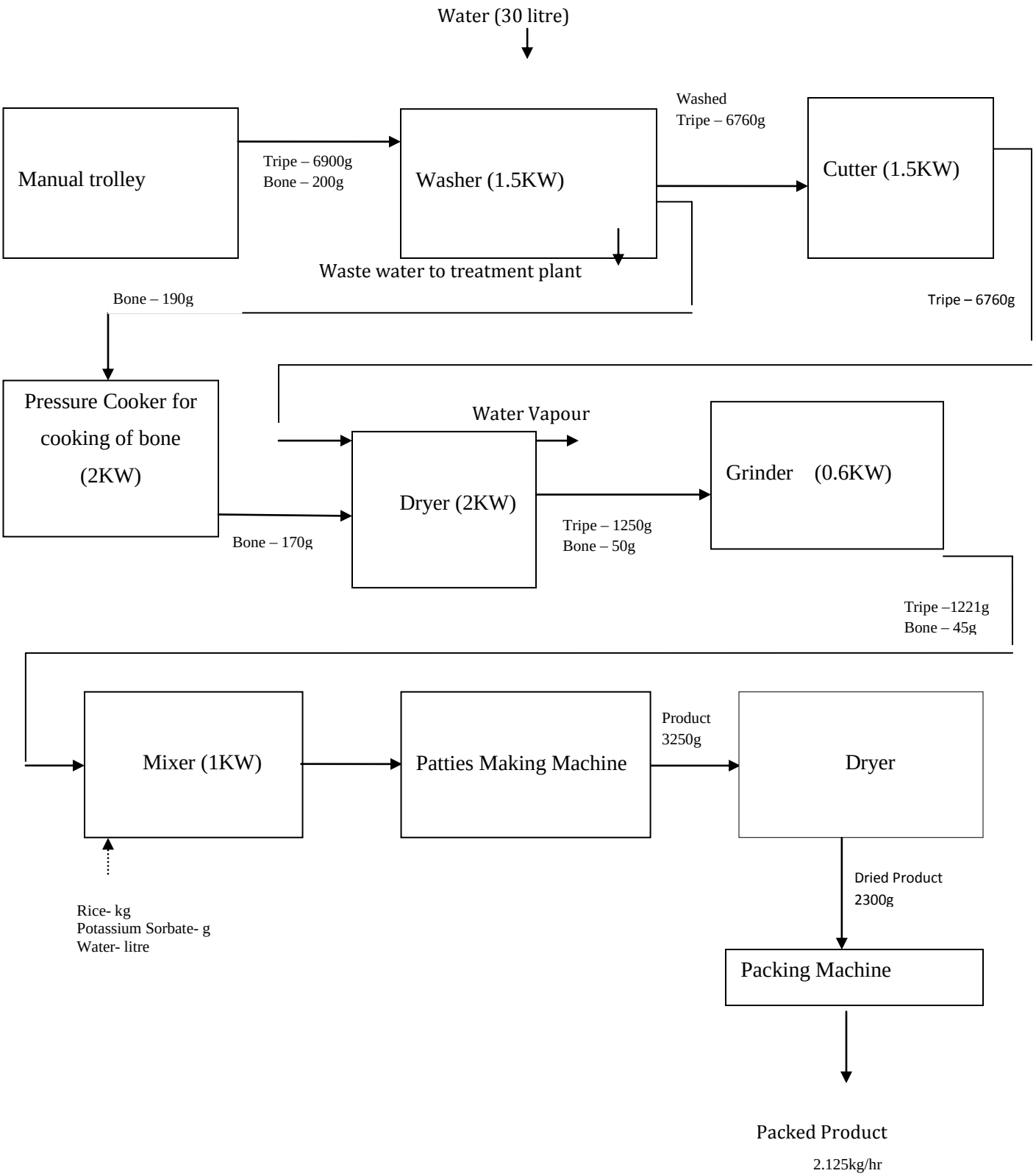
glandular tissue content. Flow chart 2 shows the preparation of buffalo tripe.



Flow Chart 2: Flow chart 2 for making tripe meal

Manufacturing process of extruded pet food:

To develop all the pet food ingredients were mixed and then added water for wet mixing, and cooked for 20 min. The sample was prepared using patties making machine and then dried in tray dryer at 60°C for 5 hrs. After drying it was packed in LDPE film and stored at ambient temperature (Khan and Badpa, 2012). Design of Production Technology for Pie Shaped Pet Food Show in Follow chart 3.



Flow chart 3: Process Design Flow Chart of Production Technology for Pie Shaped Pet Food

Physicochemical analyses:

The pH was measured using a digital pH meter (Thermo Orion USA). The moisture content sample placed in hot air oven (Yorco Hot air sterilizer, India) which was thermo statistically controlled at 150±10^{0}C for 30 minutes and heated until successive weighing showed no further weight loss. Ash content analysed according to the Association of Official Analytical Chemist (AOAC, 1990) method, 5 g sample was dried and transferred into crucible and ignited at 550 ^{0}C for 4-5 hrs in the muffle furnace (Tanco, India). Fat content of pet food was estimated as suggested by the Association of Official Analytical Chemist (AOAC, 1971). The protein content of pet food sample was evaluated according to the Association of Official Analytical Chemist (AOAC. 1990) method. In this method Kjeldhal apparatus was used.

RESULT AND DISCUSSIONS

The total samples were nine and coded as SF1 to SF9 and were packed in LDPE films with atmospheric packaging and kept for ambient storage. Total responses taken were five (moisture content, ash content, pH, protein content and fat content). There were two incorporated factors (tripe meal and rice flour) affecting these five responses. The parameters describing quality were evaluated in fresh condition.

Effect of physicochemical analysis of sample in fresh condition:

In fresh pet food incorporated with tripe meal and rice flour, there was moisture content (8.211%) and t value was -1.915 there is a no significant difference in the moisture content of control sample and developed pet food sample. Ash content was (3.571%) and t value -4.257 there is a significant difference in the ash content of control sample and developed pet food samples, protein content in the range of (17.85%) and t value 16.343 its show a significant difference in the protein value of control sample and developed pet foods, pH (6.688) and t value 11.685, there is a significant difference in the pH value of control sample and developed pet food samples. Fat content of sample the range (14.323%) and t value -0.476 that is shown on not significant difference in the fat content of control sample and developed pet foods. The analysis model was found significant for protein, pH, ash, and were not significant for moisture and fat. The regression model obtained for different responses.

CONCLUSIONS

The study involves the effects of maximum utilization of buffalo meat by-products incorporated dog foods, keeping in view the objective of the present study, the utilization of meat by-products in several quality characteristics of developed dog food. The Analysis used paired sample t-test for optimization. In fresh pet food incorporated with tripe meal and rice flour, there was moisture content in the range of (8.211%), Ash content (3.571%), protein (17.85%), pH (6.688) and fat in the range (14.323%). The analysis model was

found significant for protein, pH, ash and were not significant for moisture and fat.

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