

PRODUCTION OF PRECOOKED BREADED BEEF NUGGETS FOR THE SERVICE INDUSTRY

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Introduction

The food service industry offers various beef items to consumers, however most do not include the use of breading, used in making nuggets. The production of a high quality, economical, breaded beef nugget could provide the industry with a beef appetizer/entree that could prove competitive with known products from chicken or seafood. The beef nugget can be prepared by either deep-fat frying or convection oven cooking. The immediate objective of this study was to develop a value added breaded beef nugget product utilizing U.S. standard beef rounds. Standard grade beef, has low fat trim and is not utilized by retailers, but is normally processed further by the food service industry (Romans, 1994). However if this product is of high quality it could have marketing potentials in the food service industry.

Materials and Methods

Fresh standard beef rounds were purchased from a local processor and utilized in the project. Table 1 shows a standard formulation for the breaded beef nuggets. Figure 1 details the processes utilized in beef nugget production.

TABLE 1. BEEF NUGGET FORMULATION

Ingredients	Amount (%)
Beef round (Standard grade)	88.10
Sodium Tripolyphosphate (STPP)	0.40
Seasoning	1.50
Water	10.00

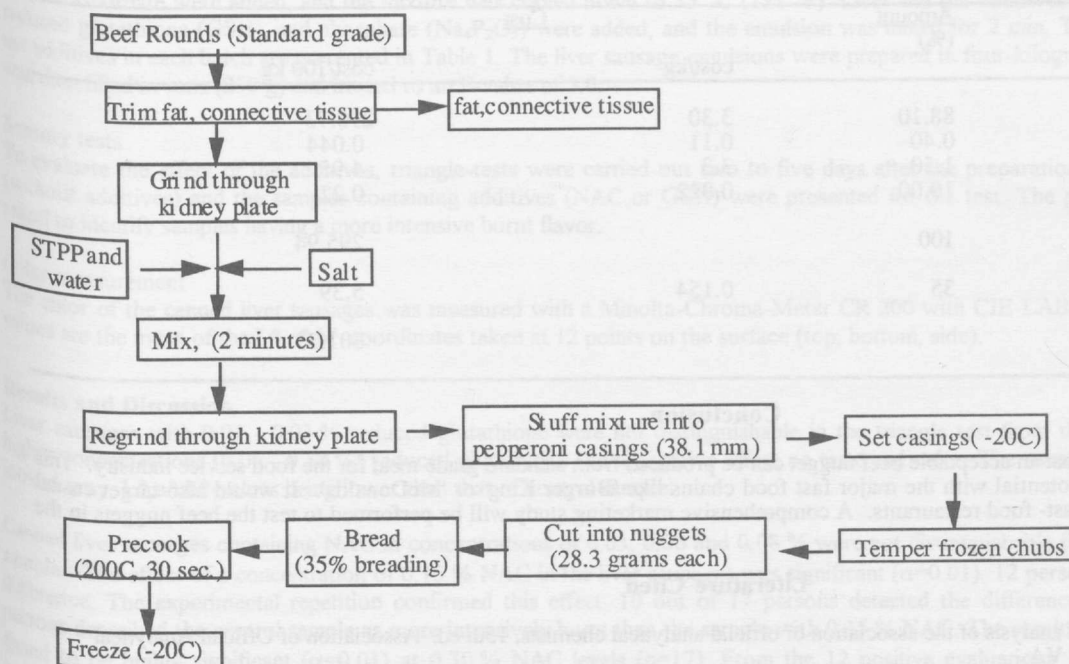


Figure 1. Processing scheme for beef nugget production.

Proximate and sensory analyses were performed on the product. For the sensory analysis an eighteen member consumer panel at ABC Research Corporation, Gainesville, FL, evaluated the beef nuggets.

Results and Discussion

Proximate analysis of the beef nugget revealed a fat content of 5.8% for the beef nugget before breading and precooking, and 15% after cooking, as shown in (table 2). Fat, protein, moisture and ash analysis were done using AOAC procedures (AOAC, 1990).

TABLE 2. PROXIMATE COMPOSITION FOR BEEF NUGGETS, BREADED AND UNBREADED.

Nugget type	Moisture (%)	Protein (%)	Fat (%)	Ash (%)	Calories (per 100g)
Unbreaded nugget	71.4	21.8	5.8	1.0	140
Breaded	68.2	15.0	14.3	2.5	190

The frozen breaded precooked beef nuggets were deep-fat fried at 200C for 5 minutes, and served warm without condiments to the panelists. The nuggets were rated on a nine point hedonic scale for color, texture, flavor, and general acceptance (Pelgram, 1957). A score of '9' denoted 'excellent', a score of '1' denoted 'extremely poor', and a score of '5 or above' denoted that the product was acceptable. The panelists rated the nuggets as highly acceptable in color, texture, flavor, and general acceptance (table 3). Ninety-five percent of the panelists commented that they would purchase the a microwaveable product.

TABLE 3. MEAN RESPONSES OF PANELISTS FOR THE BREADED BEEF NUGGETS

Sensory Parameter	Mean responses from panelists ^{ab}
Color	7.80
Texture	8.00
Flavor	8.00
General Acceptance	8.00

a Mean scores for 18 panelists. Score 7=Good; 8=Very good; 9=Excellent

b Sensory evaluation was performed at ABC Research Corporation, Gainesville, FL.

The current ingredient cost, in 1994, of the breaded beef nugget product was \$3.01/kg (Table 4). 454 grams of the unbreaded product yields approximately 16 breaded nuggets each weighing 28.3 grams each.

TABLE 4. OPTIMIZED FORMULATION AND COST ANALYSIS FOR THE BEEF NUGGETS

Ingredients	Amount (%)	Cost	
		cost/kg	cost/100 kg
Beef round	88.10	3.30	290.73
STPP	0.40	0.11	0.044
Seasoning	1.50	3.3	4.95
Water	10.00	0.022	0.22
Total Meat mix	100		295.94
Breading	35	0.154	5.39
Total nugget			301.33

Conclusion

This study demonstrated that an acceptable beef nugget can be produced from standard grade meat for the food service industry. This product would have marketing potential with the major fast food chains like 'Burger King' or 'McDonalds'. It would also target casual restaurant, bars or other similar fast- food restaurants. A comprehensive marketing study will be performed to test the beef nuggets in the food service industry.

Literature Cited

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