

ACCEPTABILITY OF NUGGETS PREPARED WITH BROILER BREEDERS, SPENT LAYER AND BROILERS BREAST MEAT

CONTRERAS, C. J.C.; NUNES, T. P.; TRINDADE, M. A.; CIPOLLI, K.M.V.A.B. and ARIMA, H. K.

Centro de Tecnologia de Alimentos – Instituto de Tecnologia de Alimentos
Av. Brasil, 2880 - Campinas – SP – Brasil, CEP 13073-001 E-mail: martrin@bol.com.br**Key Words:** spent layer, broiler breeder, broiler, breast meat, nuggets, sensory evaluation.**Background**

There are approximately 60 million spent layer and 30 million broiler breeders in Brasil. When these hens are no longer useful as egg layers, they are slaughtered and used for other purposes such as production of feeding, soup, stew and pies (AJUYAH *et al.*, 1992; VOLLER-REASONOVER *et al.*, 1997). Other possible utilization of these birds is the production of emulsified chicken products such as frankfurters and bolognas, using mechanically deboned meat (LEE *et al.*, 1997; ROUSELLE *et al.*, 1984). The manufacture of products using breast fillets can upgrade the use of spent fowls in general, considering that the rest of the carcass may be used for the production of separated meat.

To add value to spent hen meat, many researchers have studied the manufacturing of restructured and breaded products which present great acceptability in fast-food chains, institutional feeding programs and as convenience products (ROUSELLE *et al.*, 1984; ROLAND ET AL., 1981; SEIDEMAN *et al.*, 1982; BAKER *et al.*, 1984; HOLLENDER *et al.*, 1987). However, few works have been done with the purpose of comparing them to products elaborated with broiler meat, which is the raw material normally used in industry. The manufacturing of products using spent fowl breast meat could present problem regarding to texture, because older animals present a firmer meat (ROLAND ET AL., 1981). Another problem is the increase in the intensity of the chicken's flavor as it ages. (ROUSELLE *et al.*, 1984).

Objective

The purpose of the present study was to evaluate the sensory acceptability of chicken nuggets made with heavy, spent layers and broiler meat.

Methods

The breast fillets and skin were deboned from broiler breeders carcasses (3,5kg/carcass), spent layer carcasses (1,2kg/carcass) and broiler carcasses (2kg/carcass). All the meat was provided by an abattoir in the countryside of São Paulo State.

The A.O.A.C. official methods of analysis were used to determine moisture, protein, fat and ash contents.

The three types of nuggets were processed in batches of 10kg: one with broiler breast fillet and skin, other with broiler breeders breast fillet and skin and a third one using spent layer breast fillet and skin. The standard formulation is showed on Table 1. The previously frozen chicken's breast fillets were ground through a 10mm plate. Meat components for each formulation were weighed and mixed in a CAF machine model m-60 for 5 minutes. Nuggets were formed at a HOLLYMATIC machine model 54 using a 50mm plate to give 20g pieces. After this, the nuggets passed through a STEIN model 100 battering and breading line. They were passed in a pre-dust (KERRY PDA 66-TC) and then immersed into a batter (KERRY ABB 81) dissolved in proportion 1:1.6 (powder:water). For the final coat was used CLASSIC CRUMB 4034 (KERRY). The nuggets were then pre fried at 180°C for approximately one minute and then frozen and stored at -18°C for a period no longer than two weeks, until sensory evaluation.

Sensory evaluation of consumer acceptability was carried out in a hypermarket at Campinas city. A hundred and fifty consumers filled the questionnaires (Figure 1) where they registered their hedonic evaluation. The social-economic status of the consumers were registered in the questionnaire. Regarding the products, it was asked for global evaluation (flavor, juiciness and texture) of the acceptability of each product. Sensory evaluation score ranged from 1 to 7, where 1 refers to "like very much" and 7 refers to "dislike very much". The nuggets were deep fat fried from the frozen state for 2 minutes at 180°C before being served to the consumers. The design of the experiments followed was randomized complete block design.

Results and discussion

The proximate composition of chicken breasts fillets is shown in Table 2. It was observed that the composition of the 3 kinds of fillets were very similar. Moisture and fat were found to be slightly inversely related in hens and broilers.

One hundred and fifty consumers were interviewed: 62 were male and 88 female; 2% of them belonged to class A1; 12,67% to class A2; 14,67% to B1, 28% B2; 30,67% C; 10,67% D and 1,33% belonged to class E. Approximately sixty percent of consumers belonged to the classes with higher income and buying power.

The Tuckey's test results showed that there were no significative difference between treatments ($P < 0.05$). The acceptability score were respectively 1,65; 1,68; 1,73, showing high approval by the consumers. The score distribution given by the consumers for the products is shown in Figure 2. The obtained values agree with the work of ROUSELLE *et al.* (1984). These researchers did not detect change in quality or acceptance when fowl meat was used in comparison to broiler breast meat patty.

As the consumers did not find the treatments different, the buying intention was close for all nuggets: 1,68; 1,70; 1,69 for broiler, spent layer and broiler breeders respectively.

Conclusions

Consumers could not detect differences in nuggets prepared with meat from broiler, spent layer and broiler breeders.

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Table 1: Standard formulation used in the nuggets processing

Ingredients	%	Weight (g)
Breast fillet	78.00	7.800
Skin	10.00	1.000
Water	8.02	802
Salt	1.10	110
Soy protein	1.00	100
Phosphate	0.35	35
Powder onion	0.15	15
Powder garlic	0.10	10
White pepper	0.03	3
Sugar	0.20	20
Sodium lactate	0.80	80
Antioxidant	0.25	25
Total	100.00	10.000

Table 2: Proximate composition of breast fillets

	Protein(%)	Fat (%)	Moisture(%)	Ash (%)
Broiler	21.02	0.81	75.88	1.04
Broiler breeders	21.25	2.80	73.34	0.94
Spent layer	21.14	1.54	73.90	0.88

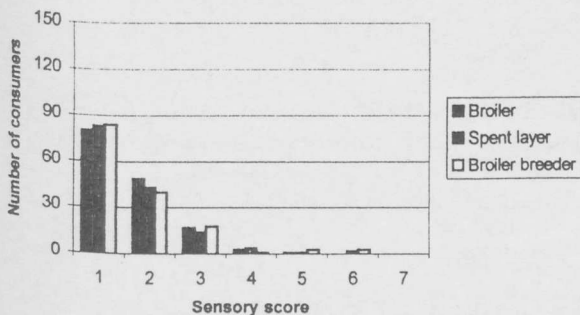


Figure 2 – Sensorial acceptability of nuggets by consumers

Figure 1: Sensory evaluation questionnaire

	Do not have	Have			
		1	2	3	4 or +
Color TV					
Radio					
Bathroom					
Car					
Maid servant					
Vacuum cleaner					
Washing machine					
VHS					
Refrigerator					
Freezer					

Instruction degree do chefe da familia

Illiterate / uncomplete fundamental	
Fundamental / uncomplete middle school	
Middle school / uncomplete high-school	
High-school / uncomplete college	
College	

Sex- F () M ()

Prove the nuggets, give your overall acceptability (flavor, texture and juiciness) and mark with an X:

- | | Samples | _____ | _____ | _____ |
|-----------------------|---------|-------|-------|-------|
| 1- LIKE VERY MUCH | () | () | () | () |
| 2- LIKE MODERATELY | () | () | () | () |
| 3- LIKE SLIGHTLY | () | () | () | () |
| 4- INDIFERENT | () | () | () | () |
| 5- DISLIKE SLIGHTLY | () | () | () | () |
| 6- DISLIKE MODERATELY | () | () | () | () |
| 7- DISLIKE VERY MUCH | () | () | () | () |

Describe what you like in the samples (flavor, texture and juiciness)

Describe what you dislike in the samples (flavor, texture and juiciness)