

MEAT QUALITY AND SENSORY ATTRIBUTES OF MEAT PRODUCED FROM BROILERS FED DIFFERENT INCLUSIONS PERCENTAGES OF PROCESSED FORMER FOODSTUFF BASED ON BAKERY BY-PRODUCT

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I. INTRODUCTION

In recent years, the impact of meat production on the environment has sparked intense debate [1]. To tackle these challenges globally, innovative solutions are being sought, with alternative feed options playing a crucial role in promoting sustainable meat production [2]. In light of this, the use of former foodstuffs as sustainable ingredients in animal feed could be a promising alternative to cereal grains. Significant efforts have been made to recover the potential nutritional value of former foodstuffs that can no longer be used for human consumption [3,4]. Among them, bakery by-products (BBP) have been shown to be effective in ruminant and swine diets [5,6], but, their impact on poultry diets and meat quality remains largely unexplored [7]. Therefore, this study aimed to investigate the effects of BBP inclusions in broiler diets on the sensory attributes and physical characteristics of meat.

II. MATERIALS AND METHODS

A total of 200 one-day-old male ROSS-308 chicks were divided into four iso-energetic and iso-nitrogenous dietary groups based on their average live weight (LW; 38.05 g \pm 0.11) (5 replicates/group and 10 birds/pen): Control (CTR: commercial feed), L-BBP (6.25% BBP), M-BBP (12.5% BBP), and H-BBP (25% BBP). BBP included as a substitute for corn-soybean meal. At day 36, birds were slaughtered, and chicken breast samples (n=5/group: for each analysis) were taken and stored at -20°C until shear force, drip loss, cooking loss, and sensory attributes were assessed. The sensory analysis involved two sessions: a discriminant analysis using a triangle test to compare the meat samples of the four groups. The number of correct judgments and their probability were calculated using a binomial distribution. An acceptability test followed, along with a descriptive assessment using the CATA method. Liking data from the acceptability test were analysed using one-way ANOVA and a two-way ANOVA model. The significance of discrimination among the four groups for each CATA attribute was determined using Cochran's Q test.

III. RESULTS AND DISCUSSION

No differences in shear force, drip loss and cooking loss results were observed between the groups. Discriminant analysis revealed that the results of the binomial tests showed no significant difference between dietary groups (Table 1). For our panel, the different inclusion levels of BBP in the broiler diet did not influence the perception of the final product, and there was no perceived difference between samples. Regarding the acceptability test and CATA questionnaire, liking scores showed no significant differences between samples and clusters of consumers. Results from Cochran's Q test on CATA attributes showed that only two attributes (Sour and Hard; $P < 0.05$), were able to discriminate between

the groups. The multivariate exploratory analysis revealed tendential differences in sensory attributes among treatments. L-BBP and M-BBP groups were associated with "sulphurous," "salty," "umami," and "dry" descriptors, while the CTR group was linked to "tender" and "sweet" descriptors. The H-BBP group exhibited "hard" (CTR:7, H-BBP:14.49, $P < 0.05$) and "fibrous" texture. These changes were influenced by protein and fat content in the diet, impacting muscle development and quality. However, BBP inclusion did not affect sensory profile or overall liking compared to the CTR group. Despite its high saturated fat content, the BBP diet showed no negative impact on meat quality, potentially due to factors like feeding duration, breed, age, and nutritional composition. Further investigation is needed to explore meat quality and nutritional composition.

Table 1. Effect of BBP on discriminant analysis

Samples	Number of Total	Number of correct Judgements	Number of incorrect Judgements	Minimum correct Judgements ($P < 0.05$)	P- value
L-BBP vs CTR	24	7	17	<13	0.737
M-BBP vs CTR	24	4	20	<13	0.980
H-BBP vs CTR	24	3	21	<13	0.995

CTR: Control feed, BBP: Bakery by-products, L-BBP: 6.25% BBP, M-BBP: 12.5% BBP, H-BBP: 25% BBP

IV. CONCLUSION

Meat quality and sensory outcomes have a positive impact on consumers' sustainable meat choices, influenced by nutritional composition and carcass characteristics. Therefore, producers should communicate these benefits to increase awareness and demand, thereby, contributing to an environmentally conscious food system.

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