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Effect of honey on cooking yield and proximate composition of meat spread

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Abstract

Meat spreads are value-added products that improve flavour, texture and nutritional quality, meeting the rising demand for diversified protein-rich foods. This study investigated how adding honey affects the cooking yield and proximate composition of meat spread made from broiler breeder spent hens. Three treatment groups were prepared with different honey levels: T₁ (0% honey), T₂ (3% honey), and T₃ (5% honey). Meat spread with 5 per cent honey had significant ($p < 0.01$) higher cooking yield compared to other treatments. No significant differences were observed among treatments for proximate parameters including moisture, ether extract, total ash and gross energy. The findings indicate that meat spread with 5 per cent honey enhances the cooking yield without altering proximate composition.

Keywords: Broiler breeder spent hen, meat spread, cooking yield, proximate composition, honey

1. Introduction

The meat processing industry in India is steadily growing, driven by urbanization, quality consciousness and changing food habits. There is an increasing market for scientifically produced meat products, including processed, packaged, convenience and ready-to-eat or ready-to-serve meat products that require minimal preparation. Processing meat into value-added products can provide meat processors with a profit margin of 15-20%, which is considerably higher than the 4-5% margin obtained from selling fresh meat (Muthukumar *et al.*, 2021) ^[5]. Spreadable products are convenient snack options that can be applied to bread or used in sandwiches, enhancing the flavour and texture of foods that might otherwise be bland. While products such as cheese spreads, mayonnaise, jams, and jellies are common in the Indian market, meat-based spreads have not yet gained widespread popularity among Indian consumers (Kumar *et al.*, 2015b) ^[4]. Chicken meat, with its favourable characteristics, offers a promising base for developing spreadable meat products, thereby expanding the range of convenient food options. Poultry is widely accepted due to its affordability, nutritional value, accessibility, and lack of religious dietary restrictions. Meat spreads, which are value-added convenience products, typically include ingredients such as meat, fat, spices, and other food additives (Khanam *et al.*, 2020) ^[2]. Honey, commonly used as a natural sweetener in the food industry, consists of around 181 components, with fructose (38%) and glucose (31%) being the primary sugars. It can be incorporated into various value-added products, including intermediate moisture foods and dried products (Raziuddin *et al.*, 2021) ^[6]. The present study was designed to assess the effect of incorporating different levels of honey (0%, 3%, and 5%) on the cooking yield and proximate composition of meat spread prepared from broiler breeder spent hens.

2. Materials and Methods

2.1 Preparation of Meat Spread

Preliminary experimental trials were conducted to standardize the ingredients and processing parameters for preparing chicken meat spread, following the procedure described by Kumar *et al.* (2015a) ^[3].

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Broiler breeder spent hens, aged 64 weeks and weighing 5-5.5 kg, were slaughtered, deboned, and trimmed of visible fat and connective tissue under standard processing conditions. The meat was cut into smaller pieces and minced using a 4 mm plate, then conditioned at $5 \pm 1^\circ\text{C}$ for 24 hours. After conditioning, the minced meat was divided into three treatment groups: T₁ (control, no honey), T₂ (3% honey), and T₃ (5% honey). The meat was blended with various ingredients (Table 2), including salt, spice mix (Table 1), condensed milk, condiments (onion and garlic), oil, tomato extract, vinegar, corn flour, and water, to form a homogeneous batter. The batter was steam-cooked under pressure for 15 minutes to reach an internal temperature of $80 \pm 2^\circ\text{C}$, followed by braising for an additional 10 minutes. Honey was added according to the treatment group before grinding. The mixture was then finely ground for about 3 minutes in a mixer to achieve a smooth, paste-like consistency. The prepared meat spread was packed into sterilized, food-grade, airtight PET containers and stored at $5 \pm 1^\circ\text{C}$ for 28 days for sensory evaluation. Data were analyzed

using one-way ANOVA, and mean values were reported with standard error (Snedecor and Cochran, 1995)^[7].

Table 1: Composition of spice mix

S. No.	Ingredients	Per cent in the mix
1.	Coriander powder	20
2.	Black pepper	15
3.	Capsicum	13.5
4.	Aniseed	12
5.	Cumin	12
6.	Turmeric	6
7.	Dried ginger	6
8.	Cinnamon	5
9.	Cardamom	3
10.	Cloves	3
11.	Caraway seed	2.5
12.	Nutmeg	1
13.	Mace	1
Total		100

Table 2: Formulation for meat spread

S. No	Ingredients	Percentage (w/w)		
		T ₁ Control	T ₂ 3 per cent Honey	T ₃ 5 per cent Honey
1	Breeder spent hen meat	48.3	48.3	48.3
2	Salt	1.2	1.2	1.2
3	Spice Mix	2	2	2
4	Condensed milk	3	3	3
5	Condiments	5.5	5.5	5.5
6	Tomato extract	2	2	2
7	Oil	2	2	2
8	Corn flour	2	2	2
9	Vinegar	1	1	1
10	Honey	0	3	5
12	Water	33	30	28
Total		100	100	100

3. Results and Discussion

3.1 Cooking Yield

The mean ($\pm$ S.E.) scores for cooking yield of the meat spread are presented in Table 3. The meat spread with 5 per cent honey had significantly ($p < 0.01$) higher cooking yield compared to meat spread without honey, followed by meat spread with 3 per cent honey. The recorded cooking yield per cent of this study aligns with the findings of Talukder *et al.* (2017)^[8], who found that cooking yield increased

significantly with an increase in the level of honey in meat spread. Similarly, Arya *et al.* (2019)^[1] observed that cooking yield per cent of meat spread with honey, vinegar and tomato powder increased significantly when compared to the meat spread without honey, vinegar and tomato powder. Raziuddin *et al.* (2021)^[6] also found that incorporating 5 per cent honey in the goat meat spread significantly increased the cooking yield compared to goat meat spread without honey.

Table 3: Cooking yield of meat spread added with honey

Cooking yield (%)	T ₁	T ₂	T ₃	Significance
	82.62 $\pm$ 0.28 ^c	87.31 $\pm$ 0.08 ^b	90.11 $\pm$ 0.02 ^a	

T₁: Control

T₂: Meat spread with 3 per cent honey

T₃: Meat spread with 5 per cent honey

* * Mean values bearing different superscripts within rows (a, b, c, d) differ highly significantly ($p < 0.01$)

3.2 Proximate composition

The mean ($\pm$ S.E.) scores for proximate composition of the meat spread are presented in Table 4. The crude protein was significantly ($p < 0.01$) higher in meat spread without honey compared to meat spread with 5 per cent honey. No significant difference was observed between treatment groups in moisture, total ash, ether extract and gross energy. The meat spread with 5 per cent and 3 per cent honey had significantly decreased crude fibre compared to meat spread without honey. The recorded proximate composition in this

study aligns with the findings of Raziuddin *et al.* (2021)^[6] who found that the crude fat and total ash content had no significant difference in goat meat spread with increasing levels of honey. The recorded per cent crude protein values in this study is not in accordance with the findings of Raziuddin *et al.* (2021)^[6] who found that the protein content increased significantly with increasing levels of honey. The results suggest that incorporating honey into spent broiler breeder meat spread formulations influences the nutritional profile.

Table 4: Proximate composition of meat spread (Mean $\pm$ S.E.)

Contents	T ₁	T ₂	T ₃	Significance
Moisture	70.20 $\pm$ 1.25	67.75 $\pm$ 0.45	67.17 $\pm$ 1.00	NS
Crude protein	15.30 ^a $\pm$ 0.49	14.49 ^{ab} $\pm$ 0.26	13.73 ^b $\pm$ 0.38	*
Crude Fibre	0.65 ^b $\pm$ 0.013	0.86 ^a $\pm$ 0.075	0.76 ^a $\pm$ 0.039	**
Ether extract	3.73 $\pm$ 0.11	3.97 $\pm$ 0.10	3.67 $\pm$ 0.10	NS
Total ash	2.48 $\pm$ 0.14	2.12 $\pm$ 0.04	2.43 $\pm$ 0.04	NS
Gross energy	1548.17 $\pm$ 57.70	1660.33 $\pm$ 20.57	1642.33 $\pm$ 46.11	NS

T₁: ControlT₂: Meat spread with 3% honeyT₃: Meat spread with 5% honey*Mean values bearing different superscripts within rows (a, b, c) differ significantly ($p < 0.05$)**Mean values bearing different superscripts within rows (a, b) differ significantly ($p < 0.01$)

NS no significant

4. Conclusion

The study demonstrated that incorporation of honey in meat spread prepared from broiler breeder spent hens influences cooking yield and nutrient composition. Meat spread containing 5 per cent honey exhibited a significantly higher cooking yield compared to meat spread without honey and meat spread with 3 per cent of honey. Although crude protein was slightly reduced at higher honey levels, no significant differences were observed among treatments for moisture, ether extract, total ash or gross energy. Overall, honey at 5 per cent level improved cooking yield without adversely affecting proximate composition.

How to Cite This Article

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Conflict of Interest

Not available.

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