EFFECT OF BATTER CONSISTENCY AS ENROBING ON QUALITY OF CHICKEN PATTIES

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ABSTRACT

Chicken patties enrobed with different ratio of bengal gram flour and water (1:1.0, 1:1.1, 1:1.2, 1:1.3 and 1:1.4) were studied on the basis of different physico-chemical characteristics viz., pH, cooking yield, proximate composition (moisture, fat and protein content) and sensory evaluation. The pH of enrobed chicken patties recorded non significant (P>0.05) decrease with increase in the level of water. The cooking yield and moisture content of enrobed chicken patties was reduced significantly (P<0.05) in 1:1.4 ratio of bengal gram flour and water. The protein and fat content were increased significantly (P<0.05) with increased level of water in enrobed patties All the sensory attributes viz., appearance, flavour, juiciness, texture, and overall acceptability of the enrobed patties made with 1:1.3 ratio of Bengal gram and water were improved significantly compared to all other groups. The results of the present study suggest that the good quality enrobed chicken patties could be made with 1:1.3 ratio of bengal gram flour and water.

Keywords: Chicken patties, Bengal gram flour, Water, Enrobing, Physico-chemical characteristics and Sensory quality.

INTRODUCTION

Enrobing is a process in which foods are traditionally coated with edible coating materials in the form of batter to provide the processors an opportunity to prepare value added chicken patties at a low cost. It also improves the product appearance, colour, crispness, flavour, juiciness and nutritive value. Further enrobing of meat products provides advantages such as preserving the nutritive value, preventing moisture and weight loss, improving juiciness and tenderness. These improvements are brought about by the coating ingredients which act as sealants and also prevent high oil uptake during frying of the product (Cunningham, 1989). Breading on the fried meat enhances texture, flavour and appearance of the product (Rao & Delaney, 1995). Attempts have been made in the past to enrobe the product by using cheaper coating material viz., pectin and bengal gram (Chidanandaiah and Keshri, 2007), bengal gram and rice flour (Chidanandaiah and Keshri, 2006). The objective of the present study was to determine the effect of enrobing on sensory quality and physico-chemical quality characteristics of enrobed chicken patties.

METHODS AND MATERIALS

Chicken carcasses were procured from local market and washed with clean water. Body fat, tendons and connective tissues were trimmed off and deboned manually. The lean meat was chilled for about 20 hrs. at 4±1 oC in refrigerator. Chilled meat...
was cut into chunks and minced in a mincer. Patties formulation containing 7.5% soy flour, 1.07% common salt, 0.38% sodium tripolyphosphate, 100 ppm sodium nitrate, 3.84 vegetable oil, 1.5% spice mix and 5.75% condiments were mixed thoroughly in the blender to obtain homogeneous mixture. After the formulation of mix each patty was prepared from 72 gm of mix and moulded into a round shape with the help of petridish (80 mm X 17 mm size). Uncooked moulded patties were enrobed with different ratio of Bengal gram and water (1:1.0, 1:1.1, 1:1.2, 1:1.3 and 1:1.4) and deep-fried in refined sunflower oil at a temperature of 150 - 160 °C for 5-7 min. Cooked patties were cooled to room temperature and subjected for further analysis.

A) Physico-chemical properties: The pH of cooked patties was determined as per the method of (Troutt et al., 1992). Ten grams of cooked patties was homogenized with 50 ml distilled water in laboratory blender. The pH of suspension was recorded with the help of pH meter. Cooking yield of the patties was calculated by recording weight of each patty before and after cooking and expressed as percentage as per Anjaneyulu et. al. (1989). Moisture, fat and protein content of cooked patties were determined following standard methods (AOAC., 1990).

B) Sensory properties: Patties were assessed organoleptically on zero day by a panel of judges for various quality attributes viz. appearance, flavour, texture, juiciness and overall palatability using 8 point descriptive scale (Keeton, 1983).

C) Statistical analysis: The data obtained during the study were subjected to statistical analysis using Completely Randomized Design (Snedecor and Cochran, 1989).

RESULT AND DISCUSSION

Physico-chemical Qualities

The result on physico-chemical quality have been presented in Table 1. The pH of chicken patties enrobed with different ratio of Bengal gram flour and water in batter did not differ significantly (P> 0.05). There was slight decline in pH with increase in ratio of batter from 1:1 to 1:1.4. The cooking yield and moisture percentage of chicken patties decreased significantly (P<0.05) with coating of batter having different consistencies. The highest cooking yield and moisture percentage was noted in chicken patties enrobed with 1:1.0 batter consistency which declined significantly with increase in ratio of flour to water. The batter consistency being used is an important factor which influences the adherence of coating that ultimately resulted in higher or lower cooking yield of the product and higher moisture in enrobe patties with 1:1.0 batter consistency may be attributed to moisture barrier properties which might have prevented oozing out of moisture during frying. Enrobing can function as efficient barriers to moisture in several foods (Biquet & Labuza, 1988; Kamper & Fennema, 1984a; Park & Chinnan, 1990; Chidanandaiah & Keshri. 2006). Protein and fat content of enrobed chicken patties was increased significantly (P<0.05) with increase in water ratio in batter. However, there was decrease in the protein and fat content in patties enrobed with 1:1.0 batter consistencies. The coating ingredients which act as sealants and also prevent high oil uptake during frying of the product (Cunningham, 1989). Further, the protein and fat content was increased with increase in water level in batter. The use of 1:1.4 batter ratio having watery consistency resulted in more moisture loss during frying and absorbed more fat, which ultimately increased the fat content of chicken patties. Chidanandaiah and Keshri (2006) also reported that crude fat content of enrobed patties with Bengal gram flour was less viscous batter consistency produced thinner coating on patties releases lot of moisture and absorb more fat during frying.

Sensory Qualities

The results on sensory qualities score (Table 2) showed that chicken patties enrobed with
Effect of batter consistency as enrobing on physico-chemical qualities of chicken patties

<table>
<thead>
<tr>
<th>Physico-chemical qualities</th>
<th>Batter consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1:1.0</td>
</tr>
<tr>
<td>pH</td>
<td>6.24</td>
</tr>
<tr>
<td>Cooking yield (%)</td>
<td>110.27</td>
</tr>
<tr>
<td>Moisture (%)</td>
<td>63.45</td>
</tr>
<tr>
<td>Protein (%)</td>
<td>21.04</td>
</tr>
<tr>
<td>Fat (%)</td>
<td>10.70</td>
</tr>
</tbody>
</table>

Means with common superscripts within a row did not differ significantly (P <0.05)

Table 1

Effect of batter consistency as enrobing on sensory qualities of chicken patties

<table>
<thead>
<tr>
<th>Sensory qualities</th>
<th>Batter consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1:1.0</td>
</tr>
<tr>
<td>Appearance</td>
<td>6.80</td>
</tr>
<tr>
<td>Flavour</td>
<td>6.00</td>
</tr>
<tr>
<td>Juiciness</td>
<td>6.40</td>
</tr>
<tr>
<td>Texture</td>
<td>6.60</td>
</tr>
<tr>
<td>Overall acceptability</td>
<td>5.80</td>
</tr>
</tbody>
</table>

Means with common superscripts within a row did not differ significantly (P <0.05)

Table 2

Different ratio of bengal gram flour and water had significant effect on all the sensory attributes. The highest (P<0.05) sensory score were recorded for the batter consistency containing 1:1.3 of bengal gram flour and water for all the sensory attributes. The flavour and texture scores of patties with batter having 1:1.2 consistencies were comparable indicating that the solid to water ratio of batter has an important bearing on the quality since it influences the adherence of batter while dipping raw patties. Improved flavour and texture with enrobing using batter consistency 1:1.3 might be due to prevention of leaching of flavour components and retention of more moisture during deep fat frying (Chidanandaiah and Keshri, 2006). Moreover, the chicken patties coated with 1:1.4 and 1:1.0 batter ratio revealed significantly (P<0.05) lowest sensory scores for all the sensory attributes. Enrobing improved the product juiciness and texture when added at desired consistencies. The lower score for juiciness and texture using 1:1.0 batter consistency can be attributed to more loss of moisture during deep frying of patties. The highest sensory scores for all the quality attributes for 1:1.3 batter consistency may be due to combined effect of coating cum enrobing which might have improved the quality characteristics of the product. Chidanandaiah and Keshri (2006) also reported that bengal gram flour enrobed buffalo meat patties having 1:1.3 batter consistencies were better in sensory quality.

CONCLUSION

Based on observations it could be concluded that enrobing of chicken patties with

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*Means with common superscripts within a row did not differ significantly (P <0.05)*
1:1:3 batter ratio containing bengal gram flour and water were found to be better in sensory and physico-chemical qualities.

REFERENCES


