

# Preparation and Evaluation of Chicken Rolls with Baking Powder

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## ABSTRACT

The effect of yeast and baking powder on the storage stability of chicken rolls was studied with the combination of 100:0, 75:25, 50:50, 25:75, 0:100 ratio respectively. Effect of different treatments and storage for 0-48 hours on moisture, protein, fat, fiber, ash and nitrogen free extract contents of chicken rolls prepared from wheat flour were studied for quality acceptability. It was observed that moisture and protein contents of rolls showed a decline in their values while fat, fiber, ash and nitrogen free extract were increased during storage period. During storage the color of the product was improved when leavening agents comprising of yeast and baking powder in 50:50 ratios, with respect to aroma, it was noted that this character was significantly affected in T5 comprising of 100% baking powder as leavening agent. The rating of rolls with respect to taste and flavor by trained panel of judges ranked the T3 comprising of yeast and baking powder in 50:50 as leavening agents the best one in comparison to the others with acceptable chemical composition. Texture quality of the product was also superior in this case.

**Key Words:** Chicken Rolls; Baking Powder; Protein; Nitrogen

## INTRODUCTION

Wheat as a staple food in Pakistan is used to prepare flattened bread locally named as chapatti. Along with main product (chapatti) it is used for several purposes to produce bakery products including biscuits, cake, pastries, patties, buns and rolls. A wide varieties of wheat available in Pakistan is intended for their specific uses. Soft wheats are mainly considered as the best for the production of biscuits, cookies and rolls, whereas, fermented bread is produced from hard wheats. One such product made from soft wheats is chicken roll in which wheat flour and chicken are used along with yeast (leavening agent). Baked products become light, as a rule, by the expansion of carbon dioxide cells that are evolved within the dough or batter during both the fermentation and baking stage. The resulting cellular structure, not only contribute a pleasant appearance but it is also an affective aid in digestion process. In this way a greatly extended surface is presented to the action of digestive juice. (Kichline & Conn, 1970). For the production of bakery products several baking powders of different types available in the market is utilized which are mostly imported or some are locally produced. Keeping in view the efficacy of baking powders this project was designed to prepare rolls stuffed with chicken using baking powder consisting of locally available ingredients for replacing yeast. The objectives of this project were

1. Preparation of chicken rolls by using baking powder in different proportions for replacing yeast.
2. To study the physicochemical properties and sensory evaluations of wheat flour and chicken rolls prepared with respect to treatments and storage hours.
3. To find out the best suitable dose of baking powder for

yeast replacement in chicken roll preparation.

## MATERIAL AND METHODS

The research project was carried out in the institute of food science and technology, university of agriculture, Faisalabad.

**Procurement of raw material.** The raw material used in the preparation of rolls (wheat flour, ghee, sugar, eggs, baking powder and salt) were produced from the local market of Faisalabad.

**Preparation of rolls.** Rolls were prepared by mixing all the ingredients using different levels of baking powder for replacing yeast as mentioned in the Table I.

**Proximate analysis of rolls.** The prepared rolls were analyzed for the proximate analysis including moisture, crude fat, crude protein., crude fiber, ash and NFE according to the methods as described in AACC (2000).

**Sensory evaluation.** The Sensory evaluation of rolls was also conducted by a trained panel of five judges according to the method as stated by Landand and Shepherd (1998).

**Statistical analysis.** The data obtained were statistically analyzed to determine the level of significance of the results as described by Steel *et al.* (1997).

## RESULTS AND DISCUSSION

**Physico-chemical analysis of chicken rolls.** The data related to the effect of different treatments of leavening agent is presented in Table II. Average moisture contents were 31.27, %31.33%, 31.40%, 31.52% and 31.71% for T1, T2, T3, T4 and T5 respectively. The highest moisture content of 31.71% was found in T5. The range for moisture

obtained in the study was similar to Maqbool (2001) who prepared chicken pizza and found that moisture contents ranged from 35.5 to 35.84%. Average protein contents were 24.21%, 23.69%, 23.48%, 23.29% and 23.14% for T1, T2, T3, T4, and T5 respectively.

The highest protein content 24.21% was found in T1 (2.0% yeast) and the lowest 23.14% was found in the chicken rolls that were made from baking powder i.e. (T5). The results regarding the protein level are collaborated by the earlier finding of Siddique (2000) who reported the protein content of pizza ranged between 25-50%. Although he concluded the higher protein level in comparison to the present study, the difference in this study could be attributed to quality of stuffed material in pizza vs. rolls. Average fat contents were 6.79%, 6.68%, 6.64%, 6.62%, and 6.75% for T1, T2, T3, T4 and T5 respectively. The highest fat content 6.79% was found in T1 which comprised of yeast only, and the lowest 6.57% was found in chicken rolls when only baking powder was used. Average fiber contents were ranged from 0.96% to 1.02% with respect to increased use of yeast in the product. Average ash contents increased from 0.92% to 1.01% with increasing number of treatments i.e., from lower doses of baking powder towards higher doses. The high ash contents 1.01% was found in T5 comprising baking powder only as leaving agent followed by 0.99% in T4 (25% yeast+75% baking powder) and the lowest 0.92% was found in chicken rolls that were made from yeast alone (T1). Average NFE contents were ranged from 35.79% to 36.62%. The highest NFE content was found in T5 (31.62%) followed by T4 36.61% and in T4 (25% yeast+75% baking powder), 36.53 in T3 and the lowest 32.79% was found in chicken rolls that were made from yeast alone (T1).

The data pertaining to the effect of storage on different aspects of chicken rolls is given in the Table III. Mean values revealed that there is significant decrease in the moisture content of chicken rolls after a period of every 24 hours.

At 0 hour, the mean moisture content for all the treatments was 32.35% which decreased to 31.17% and 30.82% after 24 and 48 hours of storage respectively. The trend is similar to that of Siddique (2000) who also observed decrease in moisture content in pizza prepared with the addition of beef during the storage period. With a passage of time the results revealed that there is significant decrease in the protein content of chicken rolls after 24 hours, whereas at 0 hour, the mean protein content for all the treatments was 23.67% which persisted the same after 24 hours but decreased to 23.35% after 48 hours of storage. These results are also supported by Ahmad (1997) who reported a decrease in protein contents in pizza during storage. Results revealed that there is significant increase in the fat content of chicken rolls after passage of time. Similar to trend in moisture contents of the product, significant increase in the fiber content of chicken rolls was also observed after every 24 hours. At 0 hour, the mean fiber content for all the

**Table I. Different combinations of leavening agents used**

Treatments	Yeast (%)	Baking powder yeast (%)
T1	2.0	0.00
T2	1.5	0.5
T3	1.0	1.0
T4	0.5	1.5
T5	0.00	2.0

**Table II. Effect of different treatments on moisture, protein, fat, fiber, ash and NFE contents of chicken rolls**

Treatments	Moisture contents	Protein contents	Fat contents	Fibre content	Ash content	NFE content
T1	31.27e	24.21a	6.79a	1.02a	0.92e	35.79c
T2	31.33d	23.69b	6.68b	1.01b	0.94d	36.35b
T3	31.40c	23.48c	6.64c	0.99c	0.97c	36.53a
T4	31.52b	23.29d	6.62d	0.98d	0.99b	36.61a
T5	31.70a	23.14e	6.57e	0.96e	0.96a	36.62a

The values were recorded as means of three observations

**Table III. Effect of storage on moisture, protein, fat, fiber, ash and NFE contents of chicken rolls**

Storage (hours)	Moisture contents	Protein contents	Fat contents	Fibre content	Ash content	NFE content
0	32.35a	23.67a	6.41a	0.93a	0.93c	35.61c
24	31.17b	23.67a	6.79a	1.01b	0.94	36.33b
48	30.82c	23.35b	6.79b	1.03c	1.04	37.19a

treatments was 0.93% which increased to 1.03% after every 48 hours of storage. Ash content of chicken rolls were found to be increased significantly after every 24 hours. At 0 hour, the mean ash content for all the treatments was 0.93% which increased to 1.04% after 48 hours of storage period. Nitrogen free extract (NFE) content of chicken rolls exhibited that at 0 hour, the mean NFE content for all the treatments was 35.61% which increased to 37.19% after 48 hours of storage that are in close agreement with the previous finding of Akram (1990).

**Sensory evaluation of chicken rolls.** Sensory evaluation of chicken rolls was done for color, taste, flavor, aroma, texture and overall acceptability. Analysis of variance exposed a highly significant difference for color taste flavor aroma texture and overall acceptability. Storage reveals a non significant difference for color, texture but the taste, flavor and overall acceptability is affected significantly. The interaction between treatments and storage intervals was found to be non significant among all the sensory attributes of chicken rolls.

The data showing the effect of different treatments on various attributes of chicken rolls is presented in table IV.

Mean scores for color were 7.17, 7.00, 8.17, 6.50 and 5.83 in T1, T2, T3, T4, and T5 respectively. The highest scores were observed in T3 (50% baking powder+50% yeast) whereas, lowest score was observed in T5 comprising of baking powder treatment only. Nam (2002) found in his

**Table IV. Effect of different treatments on color, taste, flavor, aroma, texture and overall acceptability**

Treatments	Colour	Taste	Flavour	Aroma	Texture	Overall acceptability
T1	7.17b	7.33b	6.50bc	6.50ab	6.17b	6.83b
T2	7.00c	7.00c	6.80b	6.17bc	6.50b	6.50c
T3	8.17a	8.50a	7.83a	7.50a	7.17a	7.83a
T4	6.50c	6.50cd	6.17c	5.33c	6.33b	6.17c
T5	5.83d	6.00d	5.50d	5.17c	5.33c	5.33d

**Table V. Effect of storage on color, taste, flavor, aroma, texture and overall acceptability of chicken rolls**

Storage (hours)	Color	Taste	Flavor	Aroma	Texture	Overall acceptability
0	7.20	7.40a	7.20a	6.60	6.90a	7.10a
24	6.90	7.10ab	6.60b	6.00	6.20b	6.50b
48	6.70	6.70c	5.88c	5.80	5.80b	6.00c

study that the color of chicken rolls was effected significantly with different levels of linoleic acid. Means for taste were 7.33, 7.00, 8.17, 6.50 and 6.83 in T1, T2, T3, T4, and T5 respectively. The lowest score was observed in T5 in which only baking powder was used. Means for flavor were 6.50, 6.80, 7.83, 6.17 and 5.50 in T1, T2, T3, T4 and T5 respectively. Treatment (T3) secured highest score. Javaid (2000) also found the ultimate decrease in the score for the flavor of beef sausages made from the incorporation of legumes non meat protein extenders. Mean score for aroma were 6.50, 6.17, 7.50, 5.33 and 5.17 in T1, T2, T3, T4 and T5 respectively. Yeast and baking powder in 50-50 ratio showed maximum acceptability for aroma. Means for texture were 6.50, 6.80, 7.83, 6.17 and 5.50 in T1, T2, T3, T4 and T5 respectively. Highest score was found in T3 and lowest was in T5 comprising of baking powder only. Means for overall acceptability showed 6.83, 6.50, 7.83, 6.17 and 5.33 in T1, T2, T3, T4 and T5 respectively. Treatment (T3) got maximum scores among all others indicating the highest acceptability for overall evaluation of chicken rolls. Hence T3 was found to be the best one but on overall basis the scores were reduced with the passage of time.

The data regarding the storage effect is given in table V.

Results revealed that storage had a non significant effect on color, aroma and texture of chicken rolls during 48 hours of storage interval. Mean values revealed that the non-significant difference existed between the score for these sensory characteristics. The scores obtained from these parameters were at par and insignificantly differed with the storage period. The means score values for the taste decreased from 7.40 to 6.70 after 48 hours of storage. Data showed a significant difference between the scores for flavor at 0, 24 and 48 storage intervals. But the sensory score for taste at 0 hours storage had a significant difference from 24 and 48 hours of storage. Furukhashi (1988) also indicated that the texture of bread is affected by using different levels of leavening agents. The result revealed that

a highly significant difference between the score for overall acceptability at 0, 24 and 48 hours storage intervals was exhibited. The mean score values for overall acceptability decreased from 7.10 at 0 hour to 6.00 after 48 hour of storage indicating the reduction in acceptability level after storage of 48 hrs. This decrease in scores was consistent and acceptability was found to be inversely proportional to the storage duration.

## CONCLUSION

The study showed the rating of rolls with respect to taste and flavor by trained panel of judges as T3 comprising of yeast and baking powder in 50:50 ratios as leavening agents was the best than the rest of treatments. The quality of texture was also superior in this case. The findings of this research showed that combination of yeast and baking powder in 50:50 ratios as leavening agents when used in wheat flour yielded better color, aroma, texture, flavor, taste but significant changes in overall acceptability with the storage period and ultimately variable in acceptability was observed.

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