

Effect of Addition of Turmeric Flour Mix and Papaya Leaf Flour as Feed Additive to the Quality of Broiler Chicken Meat

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Abstract. This study aims to examine the purchase of turmeric flour and papaya flour in the ration on the quality of broiler chicken meat. The design used was a completely randomized design (CRD) with 4 treatments and 5 replications. Treatment with various levels of turmeric flour and papaya leaf flour consists of P0: ration without the addition of turmeric flour and papaya leaf flour; P1: ration with the addition of 0.5% turmeric flour; P2: Ration with addition of 2,5% papaya leaf flour and P3: Ration with addition of 0.5% turmeric flour and 2,5% papaya leaf flour. The parameters studied were the level of meat protein, meat fat content, tenderness of meat and shrinkage of cooked meat. The results showed that the treatment effect was a very significant effect ($P < 0.01$) on meat protein content and meat fat content, meat tenderness showed significantly different results ($P < 0.05$), but did not provide a significant difference ($P < 0.05$) for moisture content of meat and to cook meat shrinkage. The conclusion of this study is the addition of turmeric flour and papaya leaves as feed additives in broiler chickens which have a significant effect on the quality of broiler chicken meat.

Keyword: Broiler Chicken, Meat Quality, Papaya Leaf Flour, Turmeric Flour

Introduction

Feed is an important factor and the main factor that can produce livestock production is meat. The feed given to the chicken will be given to the quality of the meat. Many farmers only provide commercial feed to broilers. The commercial feed needs to be added additional feed to increase chicken meat production. The feed additive itself is a supplementary material used as a source of providers of vitamins, minerals and antibiotics [1].

One of the various types of feed given to broilers there are also those that come from horticultural plants, one of which is turmeric. Turmeric is an herbal plant that contains curcumin and can give color to processed products and has bioactive compounds that act as antimicrobials [2].

The addition of papaya leaf flour (*Carica papaya*) in broiler chicken rations can increase protein, where papain can reduce fat accumulation in chickens. Papaya leaves are rich in alkaloids and

proteolytic enzymes such as khimopapain and lysozyme, which have a role in the process of digestion and facilitate the work of the intestine [3].

Based on this, the author wants to try to carry out research to be able to find out how effective the use of this feed additive to chicken meat with the title the effect of giving turmeric flour (*curcuma longa*) and papaya leaf flour (*Carica papaya*) on the quality of broiler chicken meat.

Materials and Methods

The material used is 150 DOC broiler comfeed broiler chickens as a test material for 35 days. Feed ingredients consisting of papaya leaf flour, turmeric flour, corn flour, rice bran, coconut cake, soybean meal, fish meal, coconut oil and top mix. Drugs such as the ND vaccine and the Gumboro vaccine, vitamins and rhodalon as disinfectants. 35 days old broiler chicken meat as a test material for meat quality, water for boiling meat, NaOH, Aquades, HCL, H₂SO₄ and H₂O₂.

Table 1. Composition of Starter Ration

Feed Ingredients (%)	Treatments			
	P0	P1	P2	P3
Corn bran	50,2	49,95	48,95	48,69
Rice bran	2	1,99	1,93	1,91
Bungkil kedelai	34,5	34,33	33,64	33,47
Fish flour	6	5,97	5,85	5,82
Coconut oil	2	1,99	1,95	1,94
Top mix	1	1	1	1
Bungkil kelapa	4,3	4,27	4,19	4,17
Papaya leaf flour	0	0	2,5	2,5
Turmeric flour	0	0,5	0	0,5
Total	100	100	100	100
CP (%)	22,98	23,41	23,53	23,76
CF (%)	4,01	4,03	4,14	4,20
CF (%)	3,51	3,49	3,45	3,40
Ca (%)	0,96	0,95	0,94	0,94
P (%)	0,59	0,59	0,60	0,60
EM (Kkal/kg)	2949,06	2950,55	2929,93	2931,42

Table 2. Composition of Finisher Ration

Feed Ingredients (%)	Treatments			
	P0	P1	P2	P3
Corn bran	64,80	64,48	63,18	62,86
Rice bran	2,50	2,48	2,41	2,40
Bungkil kedelai	21,20	21,09	20,67	20,56
Fish flour	6	5,97	5,85	5,82
Coconut oil	2	1,99	1,95	1,94
Top mix	1	1	1	1
Bungkil kelapa	2,50	2,49	2,44	2,43
Papaya leaf flour	0	0	2,5	2,5
Turmeric flour	0	0,5	0	0,5
Total	100	100	100	100
CP (%)	18,96	18,79	18,31	18,75
CF (%)	3,89	3,88	3,84	3,82
CF (%)	3,38	3,36	3,44	3,50
Ca (%)	0,91	0,91	0,91	0,90

P (%)	0,54	0,54	0,56	0,56
EM (Kkal/kg)	3111,49	3112,16	3088,30	3088,98

Research methods

The design used was a completely randomized design (CRD) with 4 treatments and 5 replications. Treatment with various levels of turmeric flour and papaya leaf flour consists of P0: ration without the addition of turmeric flour and papaya leaf flour; P1: ration with the addition of 0.5% turmeric flour; P2: Ration with addition of 2,5% papaya leaf flour and P3: Ration with addition of 0.5% turmeric flour and 2,5% papaya leaf flour. The parameters studied were the level of meat protein, meat fat content, tenderness of meat and shrinkage of cooked meat.

Results and Discussion

Protein content

Table 3. Average percentage of the broiler meat protein (%)

Treatment	Replication					Average
	1	2	3	4	5	
P0	14,87	14,01	14,62	16,96	14,18	14,93 ^C
P1	13,09	15,00	13,86	14,40	14,79	14,23 ^C
P2	15,60	16,41	15,32	17,61	18,25	16,64 ^A
P3	16,80	16,40	15,59	15,17	16,95	16,18 ^B

Note : Different superscripts in the same row and column show very significant differences (P <0.01).

According to [4] the protein content of broiler chicken is 16.34%. The highest average protein content in broiler chicken meat is in P2 which is 16.64%, while the lowest protein content of broiler chicken meat is in P1 which is 14.23%. This corresponds to the statement [5], which states that the chemical composition of meat greatly influenced by fat content. Increased protein content causes decreased water and fat content.

The presence of curcumin in turmeric can help breakdown protein into amino acids so that it can help increase levels of meat protein. Papain is a proteolytic enzyme that serves to catalyze the speed of digestion of proteins, break down various foods that contain protein into amino acids that are easily absorbed.

Water content

Table 4. Average percentage of the broiler meat water (%)

Treatment	Replication					Average
	1	2	3	4	5	
P0	77,80	77,84	77,76	78,83	69,56	76,36 ^A
P1	76,91	76,36	73,98	76,17	77,73	76,23 ^A
P2	78,74	76,84	77,92	78,25	69,24	77,90 ^A
P3	69,24	78,65	79,11	77,44	78,09	76,70 ^A

Note : Same superscripts in the same row and column show very significant differences ($P > 0.05$).

The table shows that the highest average water content in broiler chicken meat was in P2 which was 77.90%, while the lowest mean water content of broiler chicken meat was in P1 which was 76.23%. According to [6] water content in normal chicken meat ranges from 70% to 75%.

Giving turmeric in broiler chicken feed can not make a change in H + ions due to the administration of turmeric extract, so the water content in the treatment is not much different. The addition of papaya leaf extract contains a little water so it cannot affect the water content of broiler chicken meat.

Fat content

Table 5. Average percentage of the broiler meat fat (%)

Treatment	Replication					Average
	1	2	3	4	5	
P0	8,70	9,31	8,10	9,02	9,14	8,85 ^B
P1	8,53	8,77	9,38	8,03	8,58	8,67 ^B
P2	7,31	8,61	7,79	8,24	8,45	8,08 ^C
P3	8,74	9,36	9,42	9,83	9,42	9,35 ^A

Note : Different superscripts in the same row and column show very significant differences ($P < 0.01$).

The table shows that the highest average fat content in broiler chicken meat is in P3 which is 9.35%, while the lowest fat content in broiler chicken meat is in P2 which is 8.80%. [4] states that the fat content in chicken meat is 11.0%.

Papain enzymes found in papaya leaves can reduce fat in meat. According to [7] states that the utilization of papaya leaf flour 2-3% in the ration can reduce serum cholesterol and egg cholesterol, as well as increase egg yolk index. [8] states that the administration of fresh and dried papaya leaf flour can reduce levels of meat fat.

Tenderness

Table 6. Average tenderness of the broiler meat (100g/mm)

Treatment	Replication					Average
	1	2	3	4	5	
P0	28,25	26,18	32,26	28,41	27,62	28,55 ^B
P1	28,90	33,33	29,07	28,57	27,62	29,50 ^B
P2	31,65	31,85	31,65	30,30	29,24	30,94 ^A
P3	28,90	26,25	29,33	27,03	23,70	27,04 ^B

Note : Same superscripts in the same row and column show very significant differences ($P > 0.05$).

The table shows that the average tenderness of meat with the highest average in P2 treatment is 30.94 g/mm and the lowest average in P3 treatment is 27.04g/mm. According to [9] states that papain can soften meat in a short time (meat tenderizer), and can even soften meat from hard-

textured old animals. Meat tenderness is influenced by the collagen protein content found in meat.

Cooking loss

Table 7. Average cooking loss of the broiler meat (100g/mm)

Treatment	Replication					Average
	1	2	3	4	5	
P0	32,31	32,34	33,71	36,47	35,20	34,01 ^A
P1	29,89	29,34	33,77	26,86	32,37	30,45 ^B
P2	29,50	35,12	36,69	30,41	31,02	32,55 ^A
P3	30,78	28,43	30,63	30,30	31,54	30,34 ^B

Note : Same superscripts in the same row and column show very significant differences ($P > 0.05$).

The table shows that the highest average cooking losses of broiler chicken meat in P0 equipment is 34.01 % while the lowest average cooking losses of broiler chicken meat is in P3 treatment that is 30.34 %. According to [10] Cook losses generally vary between 1.5% to 54.5% with a range of 15% to 40%. [11] states that in addition to the temperature and cooking time, cooking losses are influenced by the pH of the meat, the length of the sarcomere, the muscle fibers, the length of the cut fibers, the contraction status of the myofibrils of the meat, the size and weight of the sample, the cross section, the fat content in the meat and the binding capacity of the meat.

Conclusion

The addition of turmeric flour mixture and papaya leaf flour as feed additives affect the content of protein, fat, and meat tenderness. The addition of papaya leaf flour to the ration can increase the protein content, water and tenderness of broiler chicken meat and reduce fat content. The addition of turmeric flour to the ration produced the lowest water content in broiler chicken meat. Adding a combination of turmeric flour and papaya leaf flour to the ration produced the highest fat content in broiler chicken meat.

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