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Effect of turmeric powder addition on quality characteristics of pyeonyuk (#469)In Kyu Bae¹, Kwon Jung Kim¹, Jung Heun Ha², Myoung Ok Jung³, Yang Il Choi¹¹ chungbuk national university, animal science, cheongju, South Korea; ² dankook university, food science and nutrition, yongin, South Korea; ³ Foundation of Agri. Tech. Commercialization & Transfer, Agricultural Product Inspection Team, Iksan, South Korea**Introduction**

The world meat consumption has increased in recent years which means that large quantity of edible meat byproducts are produced higher while the utilization of these by-products for human consumption might decline. Korean traditional food 'pyeonyuk' is a sliced food after boiling and pressing pork head meat. The pork head meat has 57.0% moisture content, 20% protein content, 21.5% fat content, and high content of essential amino acids such as lysine, leucine, isoleucine, threonine, and phenylalanine (Skarpeid et al. 2001). Thus, by-products have a strong potential to be used as food materials. Turmeric, which belongs to a group of aromatic spices, has been originally used as a food additive in curries to improve the storage condition, palatability and preservation of foods (Jayaprakasha et al. 2005). As added to various food preparations, turmeric preserves their freshness and imparts a characteristic flavor. Therefore, in this study, we investigated the effects of turmeric powder (TP) on pyeonyuk quality and storage characteristic.

Methods

Table 1. Formulation of pyeonyuk with TP(%).

Items	CON	T1	T2	T3
Head meat	89.55	89.55	89.55	89.55
Sirloin	9.95	9.95	9.95	9.95
Salt	0.4	0.4	0.4	0.4
Pepper	0.1	0.1	0.1	0.1
Turmeric	0	0.1	0.3	0.5
Total	100.0	100.1	100.3	100.5

Head meat and sirloin were obtained in vacuum packaged containers from a local market (Open market CO, Jeonnam, Korea). Head meat and sirloin were kept frozen at -24 °C for a day and ground using a Model C50 silent cutter (FATOSA CO., Barcelona, Spain). After removing the skin of turmeric, it was ground with a blender and prepared in powder form. Turmeric (Foodmam CO., Korea) was added according to the level of addition (0%, 0.1%, 0.5%) and other ingredients (salt, pepper) were added and mixed at high speed (2,700 rpm). 1kg of mixed meat was placed in a cube and put in a refrigerator at 4°C for 12 hours to complete the pyeonyuk. Three replications were made for each treatment and analysis was carried out.

Results

Proximate analysis of the pyeonyuk according to the addition level of TP are shown in Table 3. Water content decreased proportionally with increasing content of TP. An increase of whey powder has been reported to reduce the

water content in beef meatball (Serdaroğlu et al. 2006). Protein of pyeonyuk was significantly lower in control than in other treatments. The fat content of pyeonyuk did not show a remarkable change when adding TP. The ash contents of the control and all treatments were 0.04 to 0.73. The pH of all treatments with added TP ranged from 6.34 to 6.36, which was lower than that of the control.

Color, WHC and Cooking loss of the pyeonyuk according to the addition level of TP are presented in Table 3. The L* values of the pyeonyuk ranged from 67.16 to 71.23, the lightness values tended to decrease as the amount of added TP increased. The a* value of redness is significantly higher in the control than in the other treatments. The yellowness value (b*) of the control group was the lowest at 14.84 and the TP added group showed a tendency to increase from 33.35 to 52.05. Lim (2011) study showed that the addition of 2%, 4%, 6%, and 8% of turmeric to bread resulted in lower brightness and redness and increased yellowness. The WHC (water holding capacity) of pyeonyuk was 51.52 ~ 73.95.

Regarding texture, there was no significant difference in T1 treatment compared to the control, but T2 and T3 treatments were significantly higher than control. The color was significantly higher when added with TP than the control. In the juiciness of pyeonyuk, T3 treatment was the lowest. There was no statistically significant difference among treatments in flavor and total acceptability of pyeonyuk.

Conclusion

The turmeric powder did not significantly reduce the quality characteristics of the pyeonyuk. The addition of 0.5% of TP did not decrease the water holding capacity compared to the control, and increased the storage characteristics by inhibiting lipid oxidation. Therefore, the addition of 0.5% turmeric powder to the pyeonyuk can be applied as a natural preservative for meat products and will be applied as a functional food.

Notes

Table 1. Physicochemical characteristics of broiler chickens fed with hydrolyzed collagen from pig skin^a

Treatment ^b	CON ^c	T1 ^c	T2 ^c	T3 ^c	PC ^c
Moisture ^d	75.48±0.2 ^a	73.44±2.43 ^b	73.19±0.67 ^b	74.42±1.48 ^b	73.70±1.20 ^b
Protein ^d	18.32±0.4 ^c	17.86±2.46 ^c	18.53±0.75 ^c	17.61±0.76 ^c	17.99±0.79 ^c
Fat ^d	4.84±0.71 ^c	7.23±0.5 ^c	6.78±1.37 ^c	6.58±0.88 ^c	6.9±0.61 ^c
Ash ^d	1.35±0.21 ^c	1.45±0.17 ^c	1.48±0.08 ^c	1.37±0.17 ^c	1.39±0.2 ^c

^aCON: No addition, T1: 0.1%collagen, T2: 0.5%collagen, T3: 1.0%collagen, PC: 0.1%market collagen^a

^{b,c}Means±SD with different superscripts in the same row differ significantly ($p<0.05$).^a

Table 1.

Physicochemical characteristics of broiler chickens fed with hydrolyzed collagen from pigs

 Table 2. Quality characteristics of broiler chickens fed with hydrolyzed collagen from pig skin^a

Treatment ^b	CON ^c	T1 ^c	T2 ^c	T3 ^c	PC ^c
Drip loss ^d	4.41±0.19 ^a	2.77±0.15 ^b	2.37±0.32 ^b	3.38±0.84 ^b	3.26±0.47 ^b
Cooking loss ^d	20.2±2.32 ^a	21.37±1.04 ^a	19.25±2.16 ^a	21.67±1.11 ^a	20.86±1.81 ^a
Hunter ^d	L ^a ^d 58.82±2.72 ^a	56.88±1.2 ^{ab}	54.08±1.02 ^b	54.16±1.91 ^b	55.84±1.06 ^{ab}
Color ^d	a ^a ^d 18.57±1.04 ^a	18.26±0.4 ^a	12.58±0.62 ^b	18.73±1.23 ^a	12.78±0.66 ^b
	b ^a ^d 14.61±2.01 ^{ab}	9.56±0.44 ^c	11.88±0.61 ^{bc}	17.52±0.39 ^a	12.11±3.09 ^{bc}
WHC ^d	66.6±5.24 ^a	59.05±4.67 ^a	63.46±0.15 ^a	65.16±1.24 ^a	61.64±8.29 ^a
pH ^d	6.19±0.14 ^a	6.11±0.15 ^a	6.26±0.13 ^a	6.15±0.21 ^a	6.22±0.14 ^a
Shearforce ^d	1156.12 ^a ±201.07 ^a	1755.27 ^a ±721.66 ^a	1518.99 ^a ±277.61 ^a	1953.59 ^a ±912.12 ^a	1206.75 ^a ±325.27 ^a

^aCON: No addition, T1: 0.1%collagen, T2: 0.5%collagen, T3: 1.0%collagen, PC: 0.1%market collagen^a

L^a: lightness, a^a: redness, b^a: yellowness^a

^{b,c}Means±SD with different superscripts in the same row differ significantly ($p<0.05$).^a

Table 2.

Quality characteristics of broiler chickens fed with hydrolyzed collagen from pig skin

 Table 3. Collagen contents of broiler chickens fed with hydrolyzed collagen from pig skin^a

Treatment ^b	CON ^c	T1 ^c	T2 ^c	T3 ^c	PC ^c
Breast(mg/g) ^d	4.69 ^a ±1.58 ^a	50.90 ^a ±1.55 ^c	79.88 ^a ±4.96 ^b	226.14 ^a ±6.29 ^a	29.42 ^a ±1.58 ^d
Skin(g/100g) ^d	0.34 ^a ±0.02 ^b	0.50 ^a ±0.06 ^a	0.31 ^a ±0.00 ^b	0.16 ^a ±0.01 ^c	0.26 ^a ±0.02 ^b

^aCON: No addition, T1: 0.1%collagen, T2: 0.5%collagen, T3: 1.0%collagen, PC: 0.1%market collagen^a

^{b,c}Means±SD with different superscripts in the same row differ significantly ($p<0.05$).^a

Table 3.

Collagen contents of broiler chickens fed with hydrolyzed collagen from pig skin

Notes