Korean J. Food Sci. An.
Vol. 34, No. 5, pp. 709~716(2014)
DOI http://dx.doi.org/10.5851/kosfa.2014.34.5.709

ARTICLE

Quality Assessment of the Breast Meat from *Woorimatdag*™ and Broilers

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Abstract

The objective of this study was to compare the characteristics that define the quality of *Woorimatdag*™ (WM, a certified meat-type commercial Korea indigenous chicken breed) and a commercial broiler breed (Ross, CB). Two hundred WM and 200 CB chickens that were 1-d-old and mixed sex were obtained from a commercial hatchery and randomly assigned to floor pens (20 chickens per pen, 3.0×2.0 m) and raised under the same environmental conditions. WM breast meat contained significantly higher crude protein and ash as well as lower crude fat than CB breast meat (p<0.05). WM breast meat had slightly higher alanine, histidine, isoleucine, and glycine as well as lower phenylalanine content than CB breast meat (p< 0.05), and the WM breast meat had a low ratio of unsaturated to saturated fatty acid composition (p<0.05). However, arachidonic acid composition was higher in the WM than the CB breast meat. In addition, the inosin-5'-monophosphate content was also higher in the WM compared with the CB breast (p<0.05). The WM breast meat had higher total collagen content compared with CB breast meat. WM soup taste received higher scores with regard to sensory evaluation compared with CB soup (p<0.05). From these results, we conclude that higher amount of protein and flavor precursors and lower amount of fat in the breast meat of WM could be attractive by consumer when compared with CB.

Keywords: *Woorimatdag*™, commercial broiler, breast meat, quality

Introduction

Chicken meat is considered superior for human health compared with red meat because of its relatively low fat and cholesterol as well as high protein content (Choe *et al*., 2010). Chicken meat consumption is predicted to increase as much as 34% with a price decrease of as much as 15% by 2018 (OECD-FAO, 2009). The chicken meat that is consumed in Korea has primarily been produced from broiler breeds, which are fast in growing and require a low production cost by using an intensive fattening system (Jaturasitha *et al*., 2008). However, increased consumer demand for higher quality rather than quantity of chicken meat has chicken producers attempting to identify a way to produce higher quality chicken meat.

In many countries, there are indigenous chicken breeds that are slow in growing (Jeon *et al*., 2010; Rahayu *et al*., 2008; Tang *et al*., 2009; Wattanachant *et al*., 2004). Indigenous chicken breeds have relatively low growth performance, low feed efficiency, and low meat yield with higher market price than that of broiler breeds (Jaturasitha *et al*., 2008; Sang *et al*., 2006; Wattanachant *et al*., 2004). However, meat from indigenous chicken breed was shown to have unique taste and texture with high nutritional quality compared with broiler breeds (Choe *et al*., 2010; Tang *et al*., 2009; Wattanachant *et al*., 2004). Therefore, use of indigenous chicken breeds is one way to satisfy the consumer demand for higher quality chicken meat.

Indigenous chicken breeds in Korea have been raised in only a few farms because of low profitability that results from slow growth rates with high production cost. In order to preserve Korean indigenous chicken resources and create desired indigenous chicken breeds that can be economically raised in farms, the National Institute of Animal

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Science, RDA, Korea, developed a commercial meat-type indigenous chicken breed called *Woorimatdag*^{TM} (WM) by crossbreeding (Jung *et al*., 2011). Additionally, Choe *et al*. (2010) and Jeon *et al*. (2010) found different quality characteristics of WM compared with those of commercial broiler (CB) breeds. However, these studies did not control for various factors that influence meat quality, such as body weight, feed, and other environmental conditions (Fanatico *et al*., 2007; N'dri *et al*., 2007).

Therefore, the objective of this study was to compare the quality characteristics of the breast meat of WM and CBs that were raised under the same feed and environmental conditions and slaughtered at similar live weight.

Materials and Methods

Animal and experimental design

Two hundred 1-d-old, mixed-sex, *Woorimatdag*^{TM} (WM) (a certified muscle-type commercial Korean indigenous chicken breed, *Gallus domesticus*) and 200 commercial broilers (CB. Ross) were obtained from a commercial hatchery. Chickens were randomly assigned to floor pens (20 chickens per pen, 3.0×2.0 m) under the standard condition of temperature (1-7 d: 32°C, reduce temperature by three degrees per week and keep ultimate temperature at 21°C), humidity (1-7 d: 70%, 8-14 d: 65%, after 15 d: 60%), and ventilation (one per three hour), and 24 h fluorescent lighting for the entire experimental period. Chickens had *ad libitum* accessed to water and diet, and were fed a commercial broiler starter (0-6 d), grower (7-21 d) and finisher (21-35 and 77 d) diets. The diet contained approximately 20% of crude protein, 4% of crude fiber, 3,100 ME kcal/kg, which was a typical commercial diet produced for broilers (Chunhajeil Feed Co., Korea). Chickens were weighed every week. The weeks that both chicken breeds were arrived at similar live weights were determined as production stages (Table 1) and ten male chickens were randomly selected from WM and CB group at each production stage, respectively. The chickens were slaughtered by conventional neck cut, bled for 2 min, removed feathers, and eviscerated at each production stage. Breast meat was dissected from the carcasses after chilling at 4°C for 24 h. The skin was removed and meat samples were vacuum-packed and then stored in a freezer at -50°C until analysis.

Chicken care facilities and the procedures performed according to the standards established by the Committee for Accreditation of Laboratory Animal Care at Chungnam National University, Korea. The study was conducted in accordance with recommendations described in "The Guide for the Care and Use of Laboratory Animals" published by the Institutional Animal Care and Use Committee (IA CUC) of Chungnam National University, Korea (IACUC, 2008).

Table 1. Production stages for slaughter of *Woorimatdag*^{TM} (WM) and commercial broiler (CB) at similar live weights

Production stage	Breed	Age (wk)	Average body weight (kg)
I	WM	7	1.14
	CB	3	0.99
II	WM	9	1.57
	CB	4	1.53
III	WM	11	1.99
	CB	5	1.93

Proximate composition

The proximate compositions of the breast meat from WM and CB were determined by the methods of AOAC (1995). Briefly, moisture content was measured by drying the samples (2 g) at 102°C for 15 h. Crude protein content was measured by the Kjeldahl method (VAPO45, Gerhardt Ltd., Germany). The amount of nitrogen obtained was multiplied by 6.25 to calculate crude protein content. Crude fat content was measured by the Soxhlet extraction system (TT 12/A, Gerhardt Ltd., Germany). Crude ash content was measured by heating the sample (2 g) in a furnace set at 600°C for 12 h.

Amino acids profile

Breast meat sample (10 g) was mixed with 40 mL of 6 N HCl and hydrolyzed at 110 for 24 h. The hydrolyzed meat sample was concentrated using a rotary evaporator (Eyela, Japan) to remove HCl and the residue was cleaned 3 times with distilled water and filtered using a filter paper (No. 4, Whatman Inc., England). The filtrate made up to 50 mL with distilled water was analyzed using an amino acid analyzer (Hitachi L-8500A, Japan). Before adding HCl, cysteine and methionine were converted to cysteic acid and methione sulfone using 20 mL of a stabilizing solution (85% formic acid 45 mL + 30% H_2O_2 5 mL).

Fatty acid composition

Lipids were extracted from the breast meat samples according to the method of Folch *et al*. (1957) by mixing muscle sample (30 g) and 150 mL Folch solution (chloroform: methanol = 2:1). To this solution 0.88% KOH was

added, mixed vigorously with cap, and placed for 2 h at room temperature. Then, the upper layer was removed and chloroform was evaporated using a N_2 gas (99.999%). After cooling, 1 mL of methylating reagent (BF_3-methanol, Sigma Chemical Co., USA) was added to 100 mL of lipid, and heated at 70°C for 30 min. The samples were removed from the water bath, allowed to cool, and 2 mL of hexane (HPLC grade) and 5 mL of distilled water were added to the samples. The samples were vortexed and then hexane including the fatty acid methyl ester was transferred to gas chromatograph vial. Fatty acid composition was analyzed using a gas chromatograph (Agillent GC 6890 N, USA) equipped with a mass selective detector. A split inlet (split ratio, 50:1) was used to inject samples into a HP-5 MS capillary column (30 m × 0.25 mm × 0.25 mm film thickness, Agillent, USA), and ramped oven temperature was 150°C for 3 min, increased to 180°C at 2.5°C/min and maintained for 5 min, increased to 220°C at 2.5 °C /min and maintained for 25 min. Inlet temperature was 210°C and detector temperature 250°C. Helium was the carrier gas at constant flow of 0.7 mL/min. The temperature of the mass spectrometer (MS) source, MS quadrupole, and the transfer line into the MS were 230, 150, and 280°C respectively. The fatty acid composition was identified by a mass spectrum database (NIST Library, mass spectral search program, version 5.0, USA).

Nucleotides content

Minced meat sample (5 g) of each chicken was mixed with 25 mL of 0.7 M perchloric acid and homogenized (T25b, Ika Works) at 1,130 *g* for 1 min to extract nucleic acids. Extracted nucleic acids were centrifuged (Union 32R) at 2090 *g* for 15 min at 4ºC and filtered through Whatman No. 4 filter paper (Whatman Inc., Maidstone, England). The supernatant was then adjusted to pH 7 with 5 N KOH (SevenEasy, Mettler-Toledo Int. Inc., Switzerland). The supernatant was placed in a volumetric flask and adjusted to a volume of 100 mL with 0.7 M perchloric acid (pH 7, adjusted with 5 N KOH). After 30 min of cooling, the mixture was centrifuged (Union 32R) at 2090 *g* (4ºC) and the supernatant was analyzed using HPLC (ACME 9000, Younglin Instruments Inc., Korea). The analytical conditions for HPLC included a Waters-Atlantis dC18 RP column (4.6×250 mm, 5-μm particles, Waters Co., USA), with a mobile phase of 0.1 M triethylamine in 0.15 M acetonitrile (pH 7.0) with a flow rate at 1.0 mL/min. The injection volume was 10 μL and elution time was 25 min. The column temperature was maintained at 35ºC and detection was monitored at a wavelength of 260 nm. The content of hypoxanthine, inosine, inosine-5'-phosphate (IMP), and adenosine-5'-phosphate (AMP) were calculated using a standard curves. Standard of hypoxanthine, inosine, IMP, and AMP were obtained from Sigma.

Total collagen content

The total collagen content was determined by acid hydrolysis as described by Palka (1999). The breast meat sample (500 mg) was hydrolyzed with 25 mL of 6 M HCl at 110°C for 24 h. The hydrolysate was clarified with active carbon, filtered, neutralized with 10 M and 1 M NaOH, and diluted with distilled water to final volume of 250 mL. Hydrolysate (4 mL) and 2 mL of chloramine T solution (1.41 g chloramines T, 10 mL distilled water, 10 mL n-propanol and 80 mL citric buffer at pH 6) were mixed in a test tube and left for 20 min at room temperature. Then, 2 mL of 4-dimethyl-aminobenzaldehyde solution (10 g p-DABA, 35 mL $HClO_4$ - 60% and 65 mL isopropanol) was added. The solutions were shaken and heated at 60°C for 20 min. The samples were cooled for 5 min in tap water and the absorbance measured at 558 nm using a spectrophotometer (DU 530, Beckman Instruments Inc., USA). The amount of hydroxyproline was determined from a standard curve. The total collagen content was calculated from hydroxyproline content using the coefficient 7.25. The collagen content was expressed as mg collagen per g muscle.

Texture analysis

The breast meat sample was ground through a 6-mm plate and meat patty (5 cm diameter, 2 cm thickness and 30 g weight) was prepared. The patty was cooked to an internal temperature of 75°C. The center of cooked muscle samples were compressed twice to 75% of their original height by a texture analyzer (Model A-XT2, Stable micro systems, UK) attached with a probe (15 mm diameter) at a test speed of 2.00 mm/s and trigger force of 0.005 kg.

Sensory evaluation

For the sensory evaluation, the breast meats were heated in the water with sodium chloride (1:1.5:0.01, w/v/w) at 100ºC for 1 h using a gas burner and cooked to an internal temperature of 85°C. Meat samples (2×3×1.5 cm) were placed into coded white dishes and served with drinking water. The soup (approximately 20 mL) after cooking meat were also used for sensory analysis providing by paper cup. Twenty five consumer panelists, mainly students and staff, were used to record the preference with 9-

point hedonic scales (1=unlike extremely, 5=like moderately, 9=like extremely). The sensory parameters tested were color, odor, taste, texture, and overall acceptance for the breast meat. For the soup, all the sensory parameters were used as meat sample except for texture. All samples were labeled with random 3-digit numbers and presented to panelists in random order.

Statistical analysis

All analyses in the present study were conducted with three replication at each production stage. All data from three production stages was pooled and analyzed by the procedure of General Linear Model using SAS program (version 9.3, SAS Institute Inc., USA). Tukey's multiple range test was used to compare significant differences between mean values ($p<0.05$). Mean values and standard error of the means (SEM) are reported.

Results and Discussion

Proximate composition

To confirm the genotype effect on meat quality, in this study, WM (a slow-growing genotype) and CB (a fast-growing genotype) chickens were reared with the same diet and chicken house to remove the effect of environment on meat quality. The proximate composition of the WM and CB breast meat is reported in Table 2. There were no significant differences between WM and CB with regard to breast meat moisture content. However, the crude fat content of the WM breast meat was significantly lower than of the CB breast meat ($p<0.05$). Additionally, the WM breast meat had high crude protein and ash content when compared with that of CB ($p<0.05$). These results were similar to the proximate composition of the breast meat from indigenous chicken breeds in Thailand and Malaysia, which contained lower crude fat and higher crude protein compared with CBs (Rahayu *et al*., 2008; Wattanachant *et al*., 2004).

Table 2. Proximate composition (%) of the breast meat from *Woorimatdag*™ (WM) and commercial broiler (CB) chickens

	Breed		SEM[1]
	WM	CB	
Moisture	70.82	71.50	0.346
Crude fat	2.44[b]	3.33[a]	0.163
Crude protein	21.62[a]	20.56[b]	0.109
Ash	1.38[a]	1.07[b]	0.073

[a,b]Different letters indicate significant differences between breeds ($p<0.05$).
[1)]Standard error of the mean (n=18).

It has been generally accepted that the meat of fast-growing chickens has higher fat content than that of slow-growing chickens, mainly because fast-growing breeds have been selected for fast growth that is accompanied by an increase of fat deposition in the body. Zerehdaran *et al*. (2004) reported that feed intake of most modern meat-type chickens is higher than what is required for muscle growth and maintenance and results in excessive energy that provokes increase of fat deposition in the body. In addition, the differential expression of genes that are related to lipid metabolism was confirmed between fast- and slow-growing chickens (Claire D'Andre *et al*., 2013). The activity of chickens is one of the factors that affects fat as well as protein content of the breast muscle, because the increase of activity is advantageous for myogenesis instead of lipogenesis (Castellini *et al*., 2002; Fanatico *et al*., 2007). Therefore, the relatively low crude fat and high protein content of WM compared with CB breast meat may be affected by the activity of chickens during growth; this may occur because WM chickens are more active than CB chickens and/or there is a genetic difference between WM and CB chickens. Moreover, the low fat and high protein content in the WM breast meat signifies superior nutritional quality of WM compared with CB chickens.

Amino acid profile and fatty acid composition

Amino acid profiles of the WM and CB breast meat are presented in Table 3. Among the amino acids in breast meat, the contents of five amino acids were significantly different between WM and CB chickens ($p<0.05$). The WM breast meat had slightly higher alanine, histidine, and isoleucine, which are essential amino acids, and glycine content compared with CB ($p<0.05$). However, phenylalanine content was high in CB compared with WM breast meat ($p<0.05$). Thus, amino acid compositions are slightly different depending on breed of chicken. Wattanachant *et al*. (2004) confirmed that the breast meat of Thai indigenous chickens had higher glutamic acid compared with broiler chickens. Additionally, Okarini *et al*. (2013) reported that various amino acid contents differed between the breast meat of Bali indigenous and broiler chickens.

Fatty acid composition of meat was affected by several factors such as diet, age, and genotype (Jung *et al*., 2010; Tang *et al*., 2009; Wattanachant *et al*., 2004). Table 4 shows the fatty acid composition of the WM and CB breast meat. The WM breast meat contained significantly higher amounts of saturated fatty acids (SFAs, including palmitic and steatic acid) than that of CB breast meat ($p<$

Table 3. Amino acid profiles (g/100 g) of the breast meat from *Woorimatdag*™ (WM) and commercial broiler (CB) chickens

	Breed		SEM[1]
	WM	CB	
Alanine	1.42[a]	1.38[b]	0.010
Arginine	1.38	1.36	0.014
Aspartic acid	2.30	2.23	0.019
Cysteine	0.26	0.25	0.001
Histidine	0.89[a]	0.77[b]	0.008
Glutamic acid	3.61	3.55	0032
Glycine	1.04[a]	0.99[b]	0.012
Isoleucine	0.94[a]	0.91[b]	0.007
Leucine	2.03	1.98	0.013
Lysine	2.06	2.02	0.017
Methionine	0.52	0.51	0.005
Phenylalanine	0.64[b]	088[a]	0.017
Proline	0.89	091	0.010
Serine	0.97	0.95	0.008
Threonine	1.12	1.09	0.010
Tyrosine	0.67	0.67	0.005
Valine	1.01	0.98	0.008

[a,b]Different letters indicate significant differences between breeds (p<0.05).
[1)]Standard error of the mean (n=18).

Table 4. Fatty acid composition (%) of the breast meat from *Woorimatdag*™ (WM) and commercial broiler (CB) chickens

	Breed		SEM[1]
	WM	CB	
C16:0	26.96[a]	23.04[b]	0.098
C16:1	1.11[b]	2.94[a]	0.053
C18:0	16.47[a]	14.92[b]	0.105
C18:1	30.67[b]	34.51[a]	0.177
C18:2	16.90[b]	17.59[a]	0.072
C20:4	2.96[a]	2.13[b]	0.088
C20:5	0.98	1.15	0.154
C22:6	3.95	3.71	0.172
SFA	43.43[a]	37.96[b]	0.183
USFA	56.57[b]	62.04[a]	0.183
USFA/SFA	1.30[b]	1.64[a]	0.011

[a,b]Different letters indicate significant differences between breeds (p<0.05).
[1)]Standard error of the mean (n=18).
Abbreviations: SFA, saturated fatty acid; UFA, unsaturated fatty acid.

0.05). Compared with unsaturated fatty acid (UFA) composition, monounsaturated fatty acid (MUFA) composition (palmitoleic and oleic acid) of the WM breast meat was significantly lower than that of the CB breast meat (p<0.05). In addition, the WM breast meat had low linoleic acid composition compared with that of CB breast meat (p<0.05). However, arachidonic acid composition among polyunsaturated fatty acids was significantly higher in the WM breast meat compared with that in the CB breast meat (p<0.05). Consequently, the WM breast meat had higher total saturated fatty acid composition and lower total unsaturated composition compared with CB breast meat (p<0.05).

These results are similar to those of a previous study. Jeon *et al*. (2010) found that the breast meat of Korean indigenous chickens had higher SFA and arachidonic acid compositions as well as lower UFA composition compared with that of broiler chickens. Wattanachant *et al*. (2004) reported that the breast meat from Thai indigenous chickens contained significantly higher amounts of SFAs and lower amounts of UFAs compared with broiler chickens. Dal Bosco *et al*. (2012) confirmed that slow-growing chickens had low stearoyl-CoA desaturase (Δ9-desaturase), which converts SFAs to their corresponding MUFAs, compared with fast-growing chickens. In addition, the Δ5/Δ6-desaturase indices were higher in slow- than fast-growing chickens (Dal Bosco *et al*., 2012). Therefore, the high arachidonic acid composition of the breast meat from WM compared with that of CB may be caused by the different enzyme activities of fatty acid metabolism between WM and CB chickens.

The different fatty acid compositions of meat can affect lipid stability and muscle flavor (Wattanachant *et al*., 2004). Takahashi *et al*. (2012) reported that the flavor intensity, total taste intensity, umami, and aftertaste of broiler muscle increased when arachidonic acid composition was increased by supplementation with an arachidonic acid-enriched oil diet. Thus, the high arachidonic acid composition in the WM breast meat may indicate that WM has better flavor properties than CB.

Nucleotides

In the present study, IMP content of the breast meat from WM was significantly higher than that in the CB breast meat (Table 5). This result is consistent with other studies. Tang *et al*. (2009) found that IMP content of the breast meat from 3 indigenous, slow-growing chicken breeds in China was higher than that of broiler breeds. Li *et al*. (2010) found that genotype was an important factor that affects IMP content of meat from Wenchang chickens (an indigenous chicken breed in China). In addition, there was genetic effect on IMP content in chicken meat among indigenous breeds (Jung *et al*., 2013). IMP is known to be the most important nucleotide-based flavor precursor and conjugates with monosodium glutamate to produce a synergistic effect (Kawai *et al*., 2002). There-

Table 5. Nucleotide content (mg/100 g) of the breast meat from *Woorimatdag*™ (WM) and commercial broiler (CB) chickens

	Breed		SEM[1]
	WM	CB	
AMP	4.99	4.72	0.316
IMP	286.48[a]	201.74[b]	2.530
Inosine	63.45[b]	91.94[a]	0.815
Hypoxanthine	12.67[b]	14.88[a]	0.101

[a,b]Different letters indicate significant differences between breeds (p<0.05).
[1)]Standard error of the mean (n=18).
Abbreviations: AMP, adenosine monophosphate; IMP, inosine-5'-monophosphate

Table 6. Collagen content (mg/g) and texture profile analysis of cooked breast meat from *Woorimatdag*™ (WM) and commercial broiler (CB) chickens

	Breed		SEM[1]
	WM	CB	
Collagen	2.49[a]	1.57[b]	0.103
Texture profile			
Hardness (kg)	6.54	6.14	0.146
Springiness	0.80	0.80	0.014
Cohesiveness	0.36	0.32	0.017
Chewiness (kg)	1.86	1.61	0.118

[a,b]Different letters indicate significant differences between breeds (p<0.05).
[1)]Standard error of the mean (n=18).

fore, the relatively high IMP content in the WM breast meat may have better flavor compared with CB chickens.

The accumulation of IMP in meat can be possible by two mechanism. During contraction of skeletal muscle, the excessive hydrolysis rate of adenosine triphosphate (ATP) was higher than the phosphorylation rate of adenosine diphosphate and resulted in the accumulation of inosine-5'-monophosphate (IMP) (Tullson and Terjung, 1999). Additionally, after slaughter, the rapid degradation of ATP to adenosine monophosphate leads to accumulation of IMP in meat by deaminase reaction (Surette *et al*., 1988). However, over time after slaughter, IMP degrades to inosine and hypoxanthine (Surette *et al*., 1988).

The inosine and hypoxanthine content of the CB breast meat were significantly higher than that in the WM breast meat while IMP content of the CB breast meat was significantly lower (Table 5). Similar result was found in chicken thigh meat at previous study. The inosine and IMP content of the thigh meat from broiler was significantly higher and lower than that from WM, respectively (Jung *et al*., 2011). Therefore, it seems that the degradation rate of nucleotide may rapid in CB compared with that in WM. However, further studies are required for clearer understanding.

Total collagen content and texture analysis

As shown in Table 6, total collagen content was significantly higher in the WM breast meat compared with CB breast meat (p<0.05). Collagen is one of the constituents that organize intramuscular connective tissues, such as endomysium, perymysium, and epimysium (Purslow, 2005). The increase of cross-linked collagen between collagen molecules in older animals contributes to increased strength of intramuscular connective tissue and results in tougher meat (Petracci and Cavani, 2012). Wattanachant *et al*. (2004) found that the breast meat from Thai indigenous chickens contained higher total collagen with insoluble collagen than breast meat from broiler chickens, and shear force was higher in the breast meat from Thai indigenous chickens than that of broiler chickens.

After cooking, the texture properties of both WM and CB breast meat were measured by various parameters such as hardness, springiness, cohesiveness, and chewiness. However, there was no significant difference with regard to textural parameters between WM and CB breast meat, although the WM breast meat had high collagen content compared with CB breast meat.

Sensory evaluation

The results of sensory evaluation are shown in Table 7. Color, flavor, taste, texture, and overall acceptance were not significantly different between WM and CB breast meat. Among sensory parameters, no significant difference of texture was consistent with the result of texture analysis. However, the high arachidonic acid and IMP content in WM breast meat did not affect the flavor of WM breast meat. In the sensory evaluation of soup, the WM soup was preferred in terms of taste compared with the CB soup. Jayasena *et al.* (2014) reported that a lot of compound existed in meat transferred to water when meat was boiled in water. Therefore, the higher arachidonic acid and IMP contents of WM breast meat might affect taste intensity and the preferred meaty flavor in WM soup.

In the present study, although WM and CB chickens were raised under the same environmental conditions, there was still a difference in quality of the breast meat. Based on the results of this study, the high protein and low fat content in WM breast meat could be preferable because it has higher nutritional quality, even though it contains a low ratio of UFAs to SFAs. In addition, the high flavor precursor content such as arachidonic acid and inosine-5'-monophosphate in the WM breast meat could be valuable

Table 7. Comparison of sensory characteristics of the breast meat and soup from *Woorimatdag*™, (WM) and commercial broiler (CB) chickens

		Color	Flavor	Taste	Texture	Overall acceptance
Breast	WM	5.80	5.53	5.80	5.06	5.63
	CB	5.50	5.23	5.43	5.53	5.03
	SEM[1)]	0.183	0.238	0.262	0.266	0.283
Soup	WM	5.83	5.93	6.30[a]	-	6.13
	CB	5.46	5.33	5.43[b]	-	5.50
	SEM[1)]	0.213	0.235	0.246	-	0.261

[a,b]Different letters indicate significant differences between breeds (p<0.05).
[1)]Standard error of the mean (n=50).

as high quality properties of WM compared with CB.

Acknowledgements

This work was carried out with the support of "Cooperative Research Program for Agriculture Science & Technology Development (Project No. PJ01011402)" Rural Development Administration, Republic of Korea.

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(Received 2014.8.4/Revised 2014.10.1/Accepted 2014.10.1)