Body conformation, carcass composition and physicochemical and sensory properties of meat from pheasants of different origin

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ABSTRACT: Mongolian × Versicolor and common pheasants were investigated. Birds were kept in a confined, environmentally controlled facility without outdoor access and fed *ad libitum* commercial diets for slaughter pheasants. Body weight was determined at the end of 6, 10 and 13 weeks of rearing, and body weight and body measurements were determined in 16-week-old pheasants. At 16 weeks, 20 pheasants were taken from each genetic group for slaughter. After slaughter, pH_{15} of muscles was determined and carcasses were dissected. Samples of breast and leg muscles were collected to determine water holding capacity, colour, and sensory properties of meat. Compared to common pheasants, Mongolian × Versicolor hybrids were characterized by similar body weight and body measurements except for length of trunk with neck in females. The carcasses of Mongolian × Versicolor pheasants of both sexes contained more breast muscles, leg muscles, skin with subcutaneous fat and abdominal fat. Differences in the values of these traits were not significant. Significant differences in the composition of carcasses from the groups under comparison were only found for the content of skin with subcutaneous fat and abdominal fat content in females, which were significantly higher ($P \leq 0.05$) in Mongolian × Versicolor females. The leg muscles had significantly higher pH_{15} in Mongolian × Versicolor females and significantly lower ($P \leq 0.05$) redness (a^*) in males. Compared to the common pheasants, the breast muscles of Mongolian × Versicolor pheasants received lower scores for aroma and tenderness and higher scores for taste, whereas leg muscles had higher scores for intensity of aroma and taste, and lower scores for taste and tenderness.

Keywords: pheasant; origin; body measurements; dissection; meat quality

The common pheasant (*Phasianus colchicus*) and the green pheasant (*Phasianus versicolor*) belong to the genus Phasianus in the family Phasianidae. There are about 30 subspecies of *Phasianus colchicus* and 3 subspecies of *Phasianus versicolor*. Native to Asia, the pheasant was introduced as a game bird to many parts of the world. Currently pheasants are found at different latitudes in Europe, Asia, Australia and Oceania, and North America. Pheasants were first brought to Europe by the Romans and Greeks. Different subspecies that were later brought to Europe were interbred to produce birds with highly variable plumage colour. The genotype of game pheasants currently found in Europe has been influenced to the largest extent by the Caucasus pheasant (copper or European pheasant) – *Phasianus colchicus colchicus* Linnaeus 1758, the Mongolian pheasant – *Phasianus colchicus mongolicus* Brandt 1844, and the Chinese pheasant (ring-necked pheasant) – *Phasianus colchicus torquatus* Gmelin 1789 (Rajski, 1984; Gibes, 1985; Mroz, 1998, 2003; Kuzniacka, 2005). These subspecies are similar in terms of plumage. Males have a red and rust colour on the trunk, dark green on the head, and purple-blue on the neck. Feathers on the neck and back have black edges. The plumage of hens is gray and rust in colour and serves a protective function. Ring-necked pheasant cocks have a narrow white ring on the neck and darker plumage compared to Caucasus pheasants. Male

Mongolian pheasants have a wide white ring (collar), broken in front, and more or less red and purple feathers on top compared to the Caucasus pheasants (Mroz, 1998). In addition to plumage, these subspecies of pheasants are distinguished by body weight, length of shank, wings and tail, and chest circumference. The body weight of adult males is 1.2–1.5 kg in Caucasus pheasant cocks, 1.2–1.4 kg in ring-necked pheasants, and 1.5–1.8 (or even 2) kg in Mongolian pheasants. The green pheasant, also known as Versicolor pheasant or Japanese pheasant, is considered a separate species. It is the smallest member of the Phasianus family. An adult cock weighs only between 0.9 and 1.0 kg. Males have no collar. The head, neck, front back and breast are metallic green and shiny. Wing covers are gray and tail is dark brown striped. Female plumage is similar in colour to that of female common pheasants.

In Poland, pheasants began to be kept in aviaries in the mid-1950s. Development of aviary rearing followed by mass distribution caused pheasant numbers to increase from about 25 000 in 1955 to 961 000 in 1977. In the 1980s and 1990s, the pheasant population in Poland gradually decreased. In 2002, there were about 280 000 pheasants living in the wild (Mroz, 1998, 2003; Kamieniarz, 2000; Kuzniacka, 2005).

Polish pheasant farms breed pheasants for other centres, sell 1-day-old and 10- to 12-week-old pheasants to hunting clubs, and sell fattened 16 to 18-week-old and younger pheasants. Depending on origin, nutrition, and housing method, pheasant rearing ends between 11 and 24 weeks of age. The date on which the rearing ends is determined by the achievement of proper body weight (about 1 kg) and complete plumage. Pheasants intended for meat are usually slaughtered at the age of 16 to 18 weeks. Faster growing Mongolian pheasants can already be slaughtered at the age of 13 weeks and Caucasus pheasants at 15 weeks of age (Mroz, 1998).

Over the last ten years, pheasants have been the subject of many studies which investigated their growth and body conformation (Straková et al., 2005; Kuzniacka and Adamski, 2010; Kokoszyński et al., 2011), structure and development of the digestive tract and other internal organs (Hell et al., 2003; Marzoni et al., 2005; Brudnicki et al., 2008; Baohua et al., 2010; Kokoszyński et al., 2010), dressing percentage and carcass composition (Straková et al., 2005; Adamski and Kuzniacka, 2006; Kokoszyński et al., 2008), chemical composition of meat (Večerek et al., 2005; Straková et al., 2006; Kuzniacka et al., 2007; Litwinczuk et al., 2007; Brudnicki et al., 2010), as well as physicochemical and sensory properties of pheasant meat (Dvořák et al., 2007; Kuzniacka et al., 2007; Hofbauer et al., 2010).

In the literature available to us, we found no studies concerning the meat performance and meat quality traits of Mongolian × Versicolor hybrids, and their comparisons with the common pheasant, which prompted us to undertake this research. The aim of the study was to compare Mongolian × Versicolor pheasants and common pheasants for body weight, body conformation, dressing percentage, carcass composition, and physicochemical and sensory properties of meat.

MATERIAL AND METHODS

The experimental material used in this study consisted of 45 day-old Mongolian × Versicolor pheasants and 45 common pheasants. Birds were reared for meat. Throughout the 16-week experiment, they were kept in a confined, environmentally controlled facility. Pheasants were kept in two cages on plastic mesh floor (each having an area of 1.05 m^2) for the first three weeks and penned in groups of 22–23 later on, without regard to sex. Birds were fed *ad libitum* commercial diets for slaughter pheasants containing 26.0% crude protein and 11.7 MJ metabolizable energy (ME) to 4 weeks of age, a diet containing 21.5% crude protein and 11.55 MJ ME from week 5 to 10, and a diet containing 17.0% protein and 11.5 MJ ME from week 11 to the end of the experiment.

Birds were weighed individually on electronic scales (Medicat, Ltd., Zürich, Switzerland) at the end of 6, 10, 13, and 16 weeks of rearing. Birds were indentified with padlock tags during the first weighing and their sex was identified based on plumage colour at 10 weeks of age. After weighing, 16-week-old pheasants were subjected to body measurements. Birds were tape-measured with an accuracy of 1 mm for length of trunk with neck – body length (between the first cervical vertebra and posterior superior tuberosity of the ischium), length of trunk (between tarsal joint and posterior superior tuberosity of the ischium), length of keel (from the anterior to the posterior edge of the keel), chest circumference (behind wings through anterior edge of the keel and middle thoracic ver-

tebra), length of lower thigh (along the lower thigh bone) and length of shank (between tarsal joint and posterior area of the fourth toe at its base). Body weight and body measurement values of 16-week-old pheasants were accounted for when calculating the body conformation indices of massiveness (percentage ratio of weight in kg to trunk length, in cm), compactness (percentage ratio of chest circumference to trunk length, in cm) and long-leggedness (percentage ratio of shank length to body length, in cm).

After 16 weeks of rearing, 10 males and 10 females (20 pheasants in total) with body weight similar to the mean body weight for a given sex in the group were selected from each genetic group for dissection. After slaughter, defeathering and evisceration, whole carcasses were dissected (simple dissection) according to the method described by Ziolecki and Doruchowski (1989). Each carcass was divided into breast muscles, thigh and lower thigh (leg) muscles, wings with skin, neck without skin, neck skin, skin with subcutaneous fat, and abdominal fat. The skeleton and some skeletal muscles (the remainder of the carcass) were left after the dissection. Individual carcass components were weighed on electronic scales and their percentages in eviscerated carcass with neck were calculated. The determination of pH of breast and leg muscles (thighs) was carried out 15 min post-mortem (pH_{15}). The measurement was made with a spearhead pH electrode connected to a CP-401 pH meter (Elmetron, Zabrze, Poland). The electrode was placed at a 45° angle, halfway through the muscle thickness. pH values were read on an LCD display.

After cutting (dissection) of the carcasses, samples of breast and leg muscles were collected to determine water holding capacity, colour measurements and sensory properties. Water holding capacity of breast and leg muscles was determined using a modified version of the method reported by Grau and Hamm (1952). A meat sample weighing 280 to 320 mg was placed on a filter paper between two glass plates, which were weighed down with a 2 kg weight for 5 min. After 5 min the sample was weighed again to calculate water holding capacity of the meat from the ratio of sample weight after pressing to its weight before pressing (mg), multiplied by 100%. Meat colour was determined in fresh breast muscles according to the L^* (colour lightness), a^* (redness) and b^* (yellowness) system, using a Minolta CR–310 Chroma Meter (Minolta, Tokyo, Japan).

Breast and leg muscles were subjected to sensory evaluation to determine aroma and taste intensity and desirability, juiciness, and tenderness of meat. Meat samples for sensory evaluation were cooked in a 0.6% table salt solution, in water, to meat ratio of 2:1. After cooking, the samples were chilled to 60°C (Krelowska-Kulas, 1993) and subjected to taste panel evaluation by a standing committee of 5 evaluators in accordance with a 5-point hedonic scale described by Barylko-Pikielna (1975). A 5-point scoring system was used to evaluate aroma

Table 1. Body weight of pheasants

Age (weeks)	Characteristics	Genetic group – sex – trait values			
		Mongolian × Versicolor		common	
		male	female	male	female
6	mean	407	366	422	367*
	CV	11.0	6.8	9.5	5.2
10	mean	699	590*	721	604*
	CV	8.0	10.2	10.7	8.2
13	mean	1054	808*	1053	825*
	CV	7.0	9.8	5.6	9.0
16	mean	1236	937*	1239	948*
	CV	6.1	9.2	4.8	4.5

*statistically significant differences between males and females in group ($P \leq 0.05$)

CV = coefficient of variation

and taste intensity (5 = very pronounced, 4 = pronounced, 3 = slightly pronounced, 2 = perceptible, 1 = imperceptible); aroma and taste desirability (5 = very desirable, 4 = desirable, 3 = neutral, 2 = slightly undesirable, 1 = very undesirable); juiciness (5 = juicy, 4 = moderately juicy, 3 = slightly juicy, 2 = slightly dry, 1 = dry); and tenderness (5 = very tender, 4 = tender, 3 = slightly tender, 2 = tough, 1 = very tough).

The numerical data were analysed statistically by calculating arithmetic mean and coefficient of variation (*CV*). Significance of differences between the mean values of the groups was determined using Student's t-test.

RESULTS

The average body weight of males and females from the compared pheasant groups increased with age. The highest body weight gain in males was found between 10 and 13 weeks of age, and in females between 6 and 10 weeks of rearing. Throughout rearing, male and female common pheasants had greater body weight compared to Mongolian × Versicolor pheasants, but the differences were not significant. On all evaluation dates, male common pheasants were significantly heavier than females. In Mongolian × Versicolor pheasants, a clear sexual dimorphism (significant differences) was found from 10 weeks of age (Table 1).

In terms of body dimensions, the pheasant groups differed significantly ($P \leq 0.05$) only in length of trunk with neck in females. At the age of 16 weeks, male Mongolian × Versicolor pheasants had significantly longer trunk with neck, trunk, breast bone, lower thighs and shanks, as well as significantly larger chest circumference compared to females. In common pheasants, significant differences between sexes were only found for length of trunk and lower thigh. Compared to common pheasants, male Mongolian × Versicolor pheasants had longer trunk, breast bone and shanks, and larger chest circumference. Mongolian × Versicolor females had the same length of lower thighs and shanks, and their other body dimensions were smaller compared to common pheasant females (Table 2).

The compared genetic groups did not differ significantly in body conformation indices. In both groups there were significant differences ($P \leq 0.05$) in the massiveness index between males and females. Compared to Mongolian × Versicolor pheasants, the massiveness index calculated for common pheasants was higher in males and lower in females.

Table 2. Body dimensions of 16-week-old pheasants

Trait	Characteristics	Genetic group – sex – trait values			
		Mongolian × Versicolor		common	
		male	female	male	female
Trunk with neck length (cm)	mean	29.8	26.6[a]*	30.8	27.8[b]
	CV	5.5	4.3	2.7	4.7
Trunk length (cm)	mean	20.8	17.2*	20.6	18.8*
	CV	6.3	2.6	2.6	5.8
Chest circumference (cm)	mean	28.7	24.8*	28.4	26.4
	CV	3.4	5.2	6.4	5.1
Breast bone length (cm)	mean	11.5	9.8*	11.1	10.2
	CV	7.5	4.5	5.8	8.1
Lower thigh length (cm)	mean	13.0	11.8*	13.1	11.8*
	CV	5.4	3.7	7.8	3.7
Shank length (cm)	mean	8.8	7.9*	8.6	7.9
	CV	5.0	6.8	6.3	5.2

trait mean values in rows denoted by different letters differ significantly ($P \leq 0.05$)

*statistically significant differences between males and females in group ($P \leq 0.05$)

Table 3. Body conformation indices of 16-week-old pheasants

Trait	Characteristics	Genetic group – sex – trait values			
		Mongolian × Versicolor		common	
		male	female	male	female
Massiveness index (%)	mean	5.9	5.4*	6.0	5.0*
	CV	7.1	3.0	2.8	6.8
Compactness index (%)	mean	138.0	144.2	137.9	140.4
	CV	6.7	5.9	6.3	5.3
Long-leggedness index (%)	mean	29.5	29.7	27.9	28.4
	CV	5.9	4.4	7.7	8.0

*statistically significant differences between males and females in group ($P \leq 0.05$)

Table 4. Body weight, dressing percentage, tissue composition in carcass of 16-week-old pheasants

Trait	Characteristics	Genetic group – sex – trait values					
		Mongolian × Versicolor			common		
		M	F	M/F	M	F	M/F
Body weight before slaughter (g)	mean	1249.0	933.0*	1091.0	1230.0	949.0*	1090.0
	CV	3.3	2.1	15.5	5.7	2.6	14.3
Carcass weight (g)	mean	913.0	683.0*	798.0	903.0	691.0*	797.0
	CV	3.1	2.9	15.4	4.3	2.9	15.1
Dressing percentage (%)	mean	73.1	73.2	73.1	73.4	72.8	73.1
	CV	1.7	2.0	17.5	2.5	1.3	19.6
Neck (%)	mean	4.2	4.5	4.4	4.6	4.8	4.7
	CV	10.2	8.5	10.4	6.5	10.0	16.0
Wings (%)	mean	10.4	10.7	10.6	10.7	10.4	10.6
	CV	6.1	4.7	5.3	7.9	3.8	6.1
Breast muscles (%)	mean	31.4	31.3	31.4	29.9	32.7	31.3
	CV	6.1	4.1	9.9	6.4	7.7	8.3
Leg muscles (%)	mean	23.8	23.8	23.8	23.9	23.2	23.6
	CV	4.6	8.4	6.4	7.7	3.4	5.8
Skin with subcutaneous fat (%)	mean	6.4	8.8[a]*	7.6	6.7	7.0[b]	6.9
	CV	15.5	14.2	21.8	9.3	14.7	11.9
Abdominal fat (%)	mean	0.1	1.2[a]	0.7	0.1	0.5[b]	0.3
	CV	60.0	69.1	89.1	91.0	80.0	99.0
Remainders of carcass (%)	mean	23.7	19.7	21.6	24.1	21.4	22.6
	CV	11.2	19.4	16.0	17.4	16.4	16.5

trait mean values in rows denoted by different letters differ significantly ($P \leq 0.05$)
*statistically significant differences between males and females in group ($P \leq 0.05$)
M = male, F = female

Table 5. Reaction (pH_{15}) and water holding capacity (WHC) of breast and leg muscles in 16-week-old pheasants

Trait	Characteristics	Genetic group – sex – trait values					
		Mongolian × Versicolor			common		
		M	F	M/F	M	F	M/F
pH_{15} – breast muscles	mean	5.80	5.87*	5.84	5.70	5.77*	5.74
	CV	2.70	2.60	2.60	1.50	1.90	1.60
pH_{15} – leg muscles	mean	6.51	6.77[a]*	6.64	6.57	6.56[b]	6.57
	CV	1.80	2.00	2.40	2.00	1.90	2.00
WHC – breast muscles	mean	61.10	58.30	59.70	57.10	58.10	57.60
	CV	4.40	3.40	4.50	9.50	6.10	7.50
WHC – leg muscles	mean	68.40	71.90	70.20	71.70	70.80	71.30
	CV	6.50	4.30	5.80	7.30	4.80	5.80

trait mean values in rows denoted by different letters differ significantly ($P \leq 0.05$)
*statistically significant differences between males and females in group ($P \leq 0.05$)
M = male, F = female

The indices of compactness and long-leggedness were greater in male and female Mongolian × Versicolor pheasants than in common pheasants (Table 3).

The average body weight and carcass weight of Mongolian × Versicolor pheasants of both sexes was only by 1 g higher than in common pheasants. Statistically significant differences in these traits were only noted for birds of different sexes in the group. Dressing percentage was high at 73.1% in birds of both sexes from both the groups (Table 4). Analysis of carcass composition showed significantly higher fatness, i.e. content of skin with subcutaneous fat and content of abdominal fat, in female Mongolian × Versicolor pheasants compared to common pheasants. The compared pheasant groups did not differ significantly in the other carcass components. Significant differences between males and females in carcass composition were only found in Mongolian × Versicolor pheasants for the content of skin with subcutaneous fat. The carcasses of Mongolian × Versicolor pheasants (M/F) contained more breast muscles, leg muscles, skin with subcutaneous fat and abdominal fat, and less neck and remainders of the carcass compared to the carcasses of common pheasants (Table 4).

Table 6. Colour of breast muscles in 16-week-old pheasants

Trait	Characteristics	Genetic group – sex – trait values					
		Mongolian × Versicolor			common		
		M	F	M/F	M	F	M/F
(L^*) – lightness	mean	51.4	51.4	51.4	52.1	51.2	51.7
	CV	12.9	4.5	9.1	3.0	4.4	3.6
(a^*) – redness	mean	16.0[a]	18.1*	17.1	18.8[b]	16.5*	17.7
	CV	8.6	7.3	10.0	4.0	9.9	10.0
(b^*) – yellowness	mean	4.8[a]	6.4	5.6	7. b	4.9	6.0
	CV	75.2	24.8	51.1	19.7	44.1	34.5

trait mean values in rows denoted by different letters differ significantly ($P \leq 0.05$)
*statistically significant differences between males and females in group ($P \leq 0.05$)
M = male, F = female

Table 7. Sensory properties of breast muscles in 16-week-old pheasants

Trait	Characteristics	Genetic group – sex – trait values					
		Mongolian × Versicolor			common		
		M	F	M/F	M	F	M/F
Aroma – intensity	mean	3.7	3.7	3.7	3.8	3.8	3.8
	CV	8.9	10.0	9.2	11.3	8.4	10.0
Aroma – desirability	mean	3.7	3.7	3.7	3.9	3.8	3.9
	CV	8.6	11.1	10.0	8.7	8.2	8.2
Juiciness	mean	3.7	3.7	3.7	3.7	3.7	3.7
	CV	10.0	11.6	10.8	15.1	7.3	11.6
Tenderness	mean	3.7	3.7	3.7	3.7	3.8	3.8
	CV	9.2	12.7	10.6	13.2	7.0	10.3
Taste – intensity	mean	3.9	3.8	3.9	3.7	3.9	3.8
	CV	6.9	8.9	7.9	12.4	4.9	9.5
Taste – desirability	mean	3.9	3.8	3.9	3.7	3.8	3.8
	CV	7.2	10.8	8.9	13.2	5.5	10.0

M = male, F = female

The origin of pheasants had no significant effect on pH_{15} of breast muscles. Female Mongolian × Versicolor pheasants had significantly ($P \leq 0.05$) greater pH_{15} of leg muscles. In both groups there was a significant effect of sex on pH_{15} of breast muscles, and in Mongolian × Versicolor hybrids also on the pH of leg muscles. Values of pH_{15} were higher for leg muscles than for breast muscles, and the same was true for water holding capacity.

During chroma meter evaluation, the breast muscles of Mongolian × Versicolor pheasants of both sexes showed lower colour lightness (L^*), redness (a^*) and yellowness (b^*) values compared to common pheasants. Significant differences were only found for b^* parameter in males. In Mongolian × Versicolor pheasants redness (a^*) was greater in females, and in common pheasants in males (Table 6).

The compared genetic groups did not differ significantly in sensory properties of breast and leg muscles (Tables 7 and 8). The breast muscles of Mongolian × Versicolor pheasants (M/F) were awarded lower scored for aroma intensity, aroma desirability and tenderness, the same scores for juiciness, and higher scores for taste intensity and desirability compared to the muscles of common pheasants. The leg muscles of Mongolian × Versicolor pheasants (M/F) were characterized by higher intensity of aroma and taste, lower tenderness and taste desirability, and the same aroma desirability and juiciness as in common pheasants (Table 8). Female Mongolian × Versicolor pheasants had higher values of all the analysed sensory traits of leg muscles compared to males. Compared to males, female common pheasants were characterized by higher ($P \leq 0.05$) aroma intensity and desirability.

DISCUSSION

At 6 weeks of age the body weight of the compared pheasant groups was similar to the results obtained by Ricard et al. (1991) and Krystianiak and Torgowski (1998), and at 10 weeks of age it was similar to that reported by Večerek et al. (2007) and markedly lower than in the study of Znaniecka and Sobina (1973) and Ricard et al. (1991). At 16 weeks of age, the evaluated pheasants had lower body weight than birds of the same age in the study by Nowaczewski et al. (1999), and higher body weight than reported by Winnicka (citing Mroz, 2003), Adamski and Kuzniacka (2006), and Severin et al. (2006). Similar body weights of 16-week-old pheasants (male – 1220.3 g, female – 953.4 g) were obtained by Kokoszyński et al. (2010).

Like in our study, statistically significant sexual dimorphism in the body weight of pheasants was reported by Nowaczewski et al. (1999), Sage et al. (2002), and Adamski and Kuzniacka (2006).

Table 8. Sensory properties of leg muscles in 16-week-old pheasants

Trait	Characteristics	Genetic group – sex – trait values					
		Mongolian × Versicolor			common		
		M	F	M/F	M	F	M/F
Aroma – intensity	mean	3.7	4.0*	3.9	3.4	3.9*	3.7
	CV	14.1	10.0	12.6	18.8	8.5	15.4
Aroma – desirability	mean	3.4	4.0*	3.7	3.5	3.9*	3.7
	CV	20.0	10.5	17.0	18.2	8.2	14.3
Juiciness	mean	3.5	4.0*	3.7	3.6	3.8	3.7
	CV	20.0	8.0	17.6	20.5	15.5	18.1
Tenderness	mean	3.5	4.0*	3.7	3.7	3.9	3.8
	CV	12.8	9.8	19.7	17.0	15.4	16.1
Taste – intensity	mean	3.7	4.1*	3.9	3.7	3.9	3.8
	CV	18.1	10.5	15.1	12.7	13.8	13.4
Taste – desirability	mean	3.6	4.1*	3.8	3.8	4.0	3.9
	CV	19.4	11.7	16.8	10.5	15.0	13.1

*statistically significant differences between males and females in group ($P \leq 0.05$)

At 16 weeks of age, the evaluated pheasants were characterized by longer trunk and greater chest circumference compared to game pheasants investigated by Kuzniacka (2005). In an earlier study (Winnicka, citing Mroz, 2003), 16-week-old pheasants had shorter breast bone and shanks, and greater chest circumference compared to our study. The statistically significant differences observed between males and females in all the body measurements in Mongolian × Versicolor hybrids aged 16 weeks confirmed the findings of Kuzniacka (2005).

The compared genetic groups were characterized by high dressing percentage. However, the percentage proportion of eviscerated carcass with neck to the body weight of pheasants before slaughter at 16 weeks of age was lower than in 15-week-old pheasants studied by Sarica et al. (1999). In other studies, 16-week-old pheasants were characterized by the same (Adamski and Kuzniacka, 2006) or lower (Kuzniacka et al., 2010) dressing percentage as in our study. The dissection analysis showed that the compared groups of pheasants differed significantly only in the content of skin with subcutaneous fat and in the content of abdominal fat. Significantly greater carcass fatness in female Mongolian × Versicolor pheasants makes them more suitable as stewing birds. The content of skin with subcutaneous fat in the analysed males was similar to that obtained by Kokoszyński et al. (2008). The analysed females had a higher (Mongolian × Versicolor pheasants) or lower (common pheasants) content of skin than in the experiment cited above. In a study by Adamski and Kuzniacka (2006), the carcasses of 16-week-old pheasants contained more skin with subcutaneous fat and abdominal fat (6.9%) than in the analysed males. For females, the authors cited above found higher fatness (7.7%) than in common pheasant hens, and lower fatness than in Mongolian × Versicolor hybrids. The content of abdominal fat in the carcasses of the analysed pheasants of both sexes was higher than in the experiments of Sarica et al. (1999) and Kokoszyński et al. (2008), but much lower than in the experiment of Ricard et al. (1991). Ricard et al. (1991) found that age, sex and housing system have an effect on the deposition of abdominal fat. They found the content of abdominal fat to be higher in females than in males, and higher in aviary birds than in birds confined to pheasantries. In the study under discussion, the proportion of abdominal fat in body weight doubled between 10 and 14, and between 17 and 22 weeks of age.

Likewise, the study of Kuzniacka et al. (2010) found no significant effect of genotype on the degree of carcass muscling. In our study, the content of breast and leg muscles in eviscerated carcasses from pheasants was similar to that obtained by Adamski and Kuzniacka (2006) and Kokoszyński et al. (2008).

The quality of pheasant meat was evaluated based on pH_{15} value, L^*, a^* and b^* values of meat colour, water holding capacity, and sensory properties. The pH_{15} of breast muscles in the compared genetic groups indicates the lack of quality aberrations such as DFD and PSE meat. The pH_{15} of leg muscles was higher than that of breast muscles, which is associated with the lower glycogen concentration in leg muscles after slaughter. The higher water holding capacity of leg muscles compared to breast muscles was associated with greater protein hydration, which caused increased binding of water in leg muscles. The pH_{15} of breast muscles obtained in the present study was similar to the values of the same type of muscles in 8- and 10-week-old pheasants (5.81–5.96) evaluated by Znaniecka and Sobina (1973), and lower than in 24-week-old birds: males (6.05–6.15) and females (6.3–6.5) (Winnicka, citing Mroz, 2003). Markedly lower pH_{15} values of breast muscles in 16-week-old game pheasants were reported by Kuzniacka (2005).

The mean values of lightness (L^*) obtained in the present study for breast muscles were higher (lighter meat) than those reported by Znaniecka and Sobina (1973) in pheasants aged 8 and 10 weeks (42.8 and 47.6), by Kuzniacka (2005) in 16-week-old pheasants (M/F – 46.81) and by Dvořák et al. (2007) (41.15–46.47). Higher L^* values (54.2 or 56.6) were obtained by Hofbauer et al. (2010). In our study, a^* values of breast muscles of the analysed pheasants were higher, and b^* values lower than those reported by Dvořák et al. (2007) and Hofbauer et al. (2010).

Using a 5-point scale for sensory evaluation of breast muscles, Winnicka (citing Mroz, 2003) obtained higher scores for aroma desirability, taste desirability and tenderness, as well as higher scores for juiciness of leg muscles than in our study. The same author also found higher sensory scores for meat from females than males (tastier meat), which was reflected in our results for leg muscles. Our findings are in disagreement with the results obtained by Dziadek and Gornowicz (2003) and Janocha et al. (2003) with broiler chickens, which showed a significant effect of genotype on organoleptic traits of meat.

It is concluded that compared to common pheasants, Mongolian × Versicolor pheasants showed a similar rate of body gain and body measurements except for length of trunk with neck in females. The fact that they were characterized by similar body weight, carcass weight, and dressing percentage shows that they are similar in terms of their suitability for production of broiler pheasants. The carcasses of female Mongolian × Versicolor pheasants were characterized by significantly greater fatness and slightly poorer muscling. Compared to common pheasants, the leg muscles of Mongolian × Versicolor females had significantly higher pH_{15}, and those of males showed lower redness (a^*).

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