THE IMPACT OF DRY AND WET AGING ON PORK MEAT COLOUR

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Abstract

The color of meat is the first criterion that consumers use to judge meat quality. For this reason, we decided to analyze the colorimetric differences produced by two different aging methods (dry aging and wet aging) on pork meat. The analyzed pork meat comes from pigs raised in an intensive system in Botoșani County, Romania. The colorimetric analyses involved the study of three colorimetric parameters (L, a*, and b*) at multiple stages of aging, as follows: less than 24 hours from the start of aging, and on days 4, 8, 12, 16, and 20 of aging. Colorimetric analyses were conducted on the meat's surface and in its cross-section. The instrument used for color measurements was the Konica Minolta CR-410 chromameter. The results obtained for the external color showed very significant differences ($p < 0.001$) between the types of aging for the L* and b* colorimetric parameters and significant differences ($p < 0.05$) for the a* parameter. In the meat cross-section, very significant differences ($p < 0.001$) were identified concerning the type of aging for the a* parameter and significant ($p < 0.05$) and distinctly significant differences for the L* and b* parameters, respectively. As for the differences identified between the type of aging and the progression of the aging period, the differences were very significant ($p < 0.001$) for all the studied parameters on the meat's surface, with the exception of the b* parameter, for which the differences were not significant ($p > 0.05$).*

Key words: *pork ham aging, wet-aging, dry-aging, meat color*

INTRODUCTION

The color of meat is the first criterion that consumers use to judge meat quality, and it is one of the primary factors that influence the purchasing decision [1].

Several factors influence meat color: post-mortem glycolysis, intramuscular fat content, the level of pigments (myoglobin), and the oxidative state of the pigment (the presence of myoglobin in red-purple color, oxymyoglobin in red-pink color, and methemoglobin in gray-brown color). Post-mortem glycolysis occurring in the muscles contributes to color as follows: post-mortem glycolysis lowers the muscle pH toward the isoelectric point of muscle proteins, which leads to the widening of intermyofibrillar spaces [2]. The widening of intermyofibrillar spaces is associated with a decrease in the transparency of muscle fibers and a simultaneous increase in light scattering in the meat [3].

Color is a subjective psycho-physical characteristic since it only exists in the eyes and the brain of the observer. As it is not an inherent feature of the observed object, it was necessary to determine parameters to measure, classify, and reproduce it. Currently, the color of foods is measured based on the CIE L*, a*, b* values, hue angle, and chroma. The Lab* color space, or CIELAB, is an international standard for color measurement adopted by the International Commission on Illumination (CIE) in 1976 [4]: L* represents the luminance component, ranging from 0 to

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100 (from black to white), while the parameters a* (from green if negative to red if positive) and b* (from blue if negative to yellow if positive) represent the two chromatic components varying within the range of -120 to +120 [5, 6, 7].

Information regarding dry-aged pork loin is limited, and in recent years, there has been a discussion on dry aging versus wet aging of pork loins concerning meat quality and sensory characteristics [8, 9, 10]. Although several studies have been conducted to demonstrate the difference in beef quality based on aging methods and time, research is relatively limited when it comes to comparing dry-aged pork with wet-aged pork at different intervals of the aging period [11].

MATERIAL AND METHOD

The animals (pigs) from which the meat subjected to colorimetric evaluations was sourced were raised in an intensive system on a farm located in Botoșani County, Romania.

The anatomical part on which color analyses were conducted was the pork loin, which was sourced from four pigs. The loins were portioned into approximately 12 nearly equal pieces. Half of these were subjected to dry aging, while the other half underwent wet aging. Wet aging was carried out at a temperature of 4°C, with the meat being vacuum-sealed in accordance with the method of Ha M. et al. [12]. Dry aging was conducted at temperatures ranging from 1 to 4°C in an aging chamber with controlled environmental parameters (humidity = 75-80%; airspeed = 0.75-1.2 m/s). The aging of pork meat was conducted in the Meat Processing and Meat Product section, and the colorimetric analyses were performed within the laboratory of Meat Technology and Quality Control.

To conduct color measurements, the CIELAB system was used. The L*, a*, and b* values were measured using a Minolta CR-410 colorimeter (Minolta Camera Co., Japan).

Color readings were conducted on days 0, 4, 8, 12, 16, and 20 of aging. The color reading instrument was calibrated before each analysis using a standard white plate, which was placed on a flat surface.

Color measurement was performed on ten samples for all the samples on all the mentioned days. The meat was taken out of refrigeration 30 minutes before conducting color analyses.

The purpose of this study is to determine the changes caused by the type of aging on the color of pork meat, both on the exterior and in its cross-section, using the CIELAB system.

RESULTS

The results of instrumental color analyses conducted on the surface of the meat (exterior) for the two studied aging types (dry and wet) are presented in Table 1. Color measurements of the L*, a*, and b* values in the CIELAB system were performed on days 0, 4, 8, 12, 16, and 20 of aging.

Very significant results ($p < 0.001$) were obtained for the two types of aging studied (dry and wet) on the exterior of the meat for the parameters CIE L* and CIE b* (Table 1). The days on which the measurements were taken showed highly significant differences ($p < 0.001$) for all three color parameters analyzed (CIE L*, CIE a*, and CIE b*), as can be observed in Table 1. The interaction between Type of aging*Days of aging recorded, just like Days of aging, highly significant differences ($p < 0.001$) for all color parameters studied (Table 1). By applying the Tukey Honest Significant Difference (HSD) test on the surface of pork loin, very significant differences ($p < 0.001$) were obtained on days 4, 8, and 20 of aging for the parameter L between the two types of aging. By applying the same statistical test for the parameter CIE b*, very significant differences ($p < 0.001$) were obtained between wet aging and dry aging on days 0 and 20 of aging (Table 1), and distinct significant differences ($p < 0.01$) on day 8 of aging. The parameter a* obtained, through the application of the HSD test, only distinct significant results ($p < 0.01$) on day 12 of aging between the two types of aging studied.

Table 1 The effects of aging type, duration of aging, and the interaction between aging type and duration on meat color parameters (L*, a*, and b*) on the exterior of the meat

Type of aging	Aging time	Parameters		
		L*	a*	b*
Dry	0	45.466±0.617^{c}	18.596±0.653^{abc}	4.652±0.359^{a}
	4	54.328±0.785^{f}	18.668±0.572^{abc}	5.332±0.503^{ab}
	8	56.380±0.466^{g}	18.984±0.386^{abc}	5.370±0.364^{ab}
	12	52.674±0.246^{e}	20.362±0.300^{cd}	5.584±0.534^{ab}
	16	43.686±1.034^{bc}	19.380±0.412^{bcd}	5.146±0.328^{ab}
	20	41.250±0.393^{a}	19.066±0.233^{abcd}	4.546±0.341^{a}
Wet	0	47.846±1.061^{d}	19.314±0.645^{abcd}	8.544±0.789^{cd}
	4	44.584±0.644^{bc}	17.848±0.538^{ab}	4.806±0.325^{ab}
	8	44.076±0.627^{bc}	17.070±0.457^{a}	8.192±0.448^{cd}
	12	52.764±0.576^{ef}	17.432±0.341^{ab}	4.728±0.455^{ab}
	16	42.768±0.913^{ab}	20.992±0.506^{d}	6.834±0.274^{bc}
	20	50.846±0.745^{e}	18.902±0.449^{abcd}	9.348±0.277^{d}
p-value				
Type of aging		**<0.0001** (***)	**0.039** (*)	**<0.0001** (***)
Days of aging		**<0.0001** (***)	**0.001** (***)	**<0.0001** (***)
Type of aging*Days of aging interaction		**<0.0001** (***)	**0.000** (***)	**<0.0001** (***)
Tukey Honest Signifficant Difference (HSD) test for different type of aging (wet aging versus dry aging) in the same day				
Day 0		0.457	0.995	**<0.0001** (***)
Day 4		**<0.0001** (***)	0.985	0.999
Day 8		**<0.0001** (***)	0.192	**0.002 (**)**
Day 12		1.000	**0.004 (**)**	0.962
Day 16		0.999	0.426	0.248
Day 20		**<0.0001** (***)	1.000	**<0.0001** (***)

a, b, c, d, e, f, g Superscripts on different means within the same column differ significantly, p ≤ 0.05

The average values obtained from the instrumental color analysis conducted on the cross-section of the pork loin are presented in Table 2. Similar to the surface analysis, colorimetric parameters L*, a*, and b* of the CIELAB system were analyzed on days 0, 4, 8, 12, 16, and 20 for both wet and dry aging.

The type of aging, regarding the results of the CIELAB parameters in the pork loin section (Table 2), showed highly significant differences ($p < 0.001$) for the CIE a* parameter, distinct significant differences ($p < 0.01$) for the CIE b* parameter, and significant differences ($p < 0.05$) for the CIE L* parameter. The differences obtained for the days of aging were highly significant for all three colorimetric parameters analyzed (CIE L*a*b*), and the interaction between days of aging and type of aging showed highly significant differences ($p<0.001$) for the CIE L* and CIE a* parameters.

Table 2 The effects of aging type, duration of aging, and the interaction between aging type and duration on meat color parameters (L*, a*, and b*) in the section of the meat

Type of aging	Aging time	Parameters		
		L*	a*	b*
Dry	0	48.404±1.264^{d,e}	18.440±0.678^{b,c}	4.022±0.158^{a,b}
	4	48.906±0.643^{e}	13.824±0.397^{a}	3.956±0.097^{a,b}
	8	45.818±0.561^{b,c,d,e}	17.216±0.272^{b}	5.016±0.171^{b,c,d}
	12	46.496±1.983^{b,c,d,e}	14.440±0.607^{a}	5.544±0.379^{c,d}
	16	40.638±0.493^{a}	19.322±0.254^{b,c}	4.124±0.246^{a,b}
	20	42.166±0.818^{a,b}	19.026±0.509^{b,c}	4.388±0.161^{a,b,c}
Wet	0	42.750±0.607^{a,b,c}	18.140±0.293^{b,c}	3.812±0.205^{a}
	4	47.104±0.517^{c,d,e}	18.578±0.458^{b,c}	4.942±0.442^{a,b,c,d}
	8	49.360±0.578^{e}	18.204±0.265^{b,c}	5.780±0.246^{d}
	12	44.200±0.989^{a,b,c,d}	19.454±0.514^{c}	5.464±0.250^{c,d}
	16	48.856±0.561^{e}	17.982±0.535^{b,c}	4.756±0.212^{a,b,c,d}
	20	47.472±0.745^{d,e}	19.364±0.281^{b,c}	5.042±0.122^{b,c,d}
p-value				
Type of aging		**0.025** (*)	**<0.0001** (***)	**0.002 (**)**
Days of aging		**0.001** (***)	**<0.0001** (***)	**<0.0001** (***)
Type of aging*Days of aging interaction		**<0.0001** (***)	**<0.0001** (***)	0.099
Tukey Honest Signifficant Difference (HSD) test values for different type of aging (wet aging versus dry aging) in the same day				
Day 0		**0.003 (**)**	1.000	1.000
Day 4		0.959	**<0.0001** (***)	0.189
Day 8		0.236	0.911	0.547
Day 12		0.821	**<0.0001** (***)	1.000
Day 16		**<0.0001** (***)	0.606	0.792
Day 20		**0.008 (**)**	1.000	0.759

a, b, c, d, e - Superscripts on different means within the same column differ significantly, p ≤ 0.05

By applying the Tukey Honest Significant Difference (HSD) test, very significant differences ($p < 0.001$) were identified on day 16 of aging for the L* parameter and on days 4 and 12 of aging for the a* parameter.

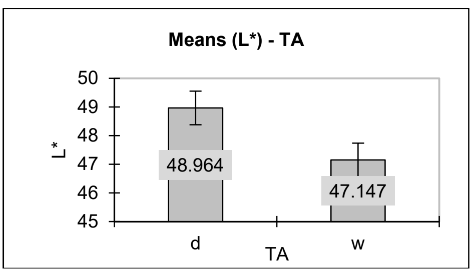

Fig. 1. Average values of the L* parameter for the entire maturation period on the exterior of the meat

L - lightness from 0 to 100; TA- type of aging; d – dry aging; w – wet aging*

The average values of the studied colorimetric parameters (L*, a*, and b*) on the meat's surface for the entire aging period and for each type of aging (dry and wet) are presented in Figure 1 for the L* parameter, in Figure 2 for the a* parameter, and in Figure 3 for the b* parameter.

Consulting the data regarding the average values of the colorimetric parameter L* for the two types of aging analyzed (wet aging and dry aging) for the entire aging period on the meat surface (Figure 1), it can be observed that dry aging obtained the highest value (48.964).

The colorimetric parameter a* measured on the exterior of the meat (Figure 2) obtained a higher average value for the entire aging period for dry aging (19.176) compared to wet aging (18.593). This phenomenon can also be observed in the case of the colorimetric parameter L* (Figure 2).

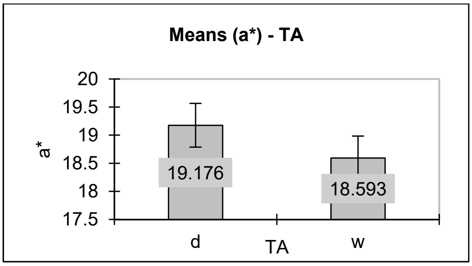

Fig. 2. Average values of the a* parameter for the entire maturation period on the exterior of the meat
a - redness (-a* - greenness); TA- type of aging; d – dry aging; w – wet aging*

The average value for the entire aging period for the parameter b* (Figure 3) showed a higher value in the case of wet aging.

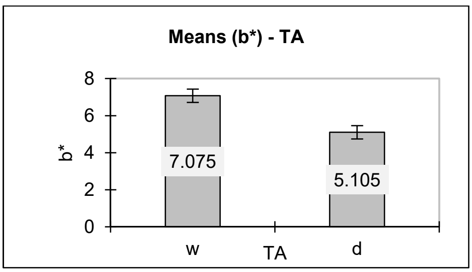

Fig. 3. Average values of the b* parameter for the entire maturation period on the exterior of the meat
b - yellowness (-b* - blueness); TA- type of aging; d – dry aging; w – wet aging*

The mean values for the L*, a*, and b* parameters in the meat section for the two types of aging studied over the entire aging period are presented in Figure 4, Figure 5, and Figure 6.

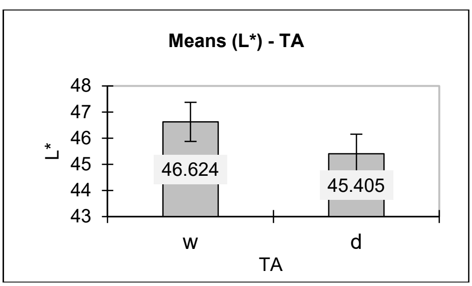

Fig. 4. Average values of the L* parameter for the entire maturation period in the section of the pork
L - lightness from 0 to 100; TA- type of aging; d – dry aging; w – wet aging*

The CIE L* parameter, measured in the pork meat section for the entire period of the colorimetric study (Figure 4), exhibited a higher average value for wet aging (46.624) compared to dry aging (45.405). These results are in contrast to those obtained in the measurements conducted on the meat surface for the same colorimetric parameter (Figure 1).

The average value of the CIE a* parameter, measured in the meat section at the end of the aging period (Figure 5), showed a higher value for wet aging, just as can be observed in the case of the average value of the colorimetric parameter L* in the meat section (Figure 4).

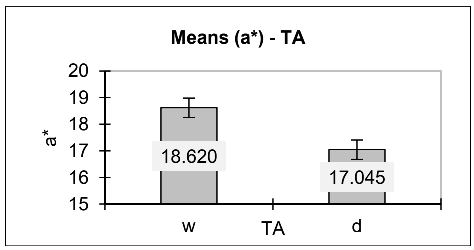

Fig. 5. Average values of the a* parameter for the entire maturation period in the section of the pork
a - redness (-a* - greenness); TA- type of aging; d – dry aging; w – wet aging*

The measurements taken on the pork meat section for the colorimetric parameter b*, at the end of the aging period (Figure 6), showed a higher average value for dry aging (4.966) compared to wet aging (4.508). These results are consistent with those obtained on the surface of the pork meat for the b* parameter (Figure 3).

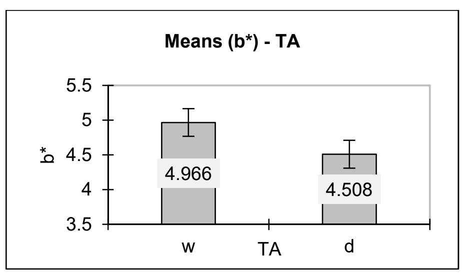

Fig. 6. Average values of the b* parameter for the entire maturation period in the section of the pork
b - yellowness (-b* - blueness); TA- type of aging; d – dry aging; w – wet aging*

The average values of the CIE L* parameter on the meat surface are presented for each of the days when colorimetric analyses were conducted, both for dry aging and wet aging in Figure 7. In Figure 9, the same average values are presented for the CIE a* parameter, while in Figure 11, the values for the CIE b* parameter are shown. Figure 8 comprises the mean values for dry aging and wet aging in the meat section for each of the days on which color measurements were conducted for the CIE L* parameter. Similarly, mean values for the CIE a* parameter are presented in Figure 10, and for the CIE b* parameter in Figure 12, for both types of aging analyzed over the six days of colorimetric measurements.

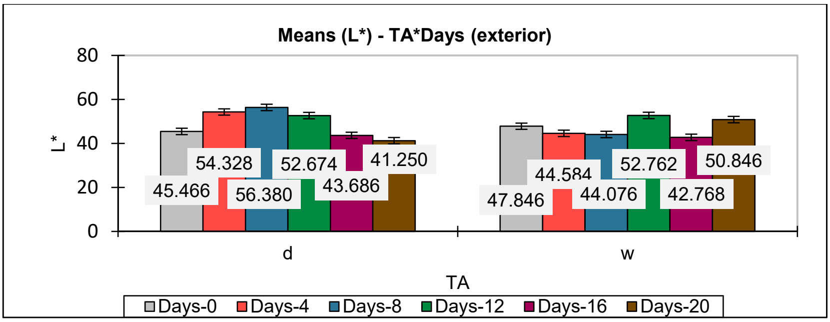

Fig. 7. Mean values of the L* parameter for both wet and dry maturation types on the exterior of the meat for each of the days when color measurements were taken
L - lightness from 0 to 100; TA- type of aging; d – dry aging; w – wet aging*

The colorimetric measurements taken on the surface of the pork meat for the L* parameter (Figure 7) showed, for dry aging, gradually increasing average values until day 8 of aging when the maximum average value of this parameter was reached (56.380). From day 8 to day 20 of dry aging, there was a gradual decrease in the L* parameter value, reaching the final value of 41.250. The maximum average value for the wet aging of the CIE L* parameter on the exterior of pork loin (Figure 7) was obtained on day 12 of aging (52.762), followed by a decrease on day 16 to a value of 42.768, and then an increase on day 20 (50.846).

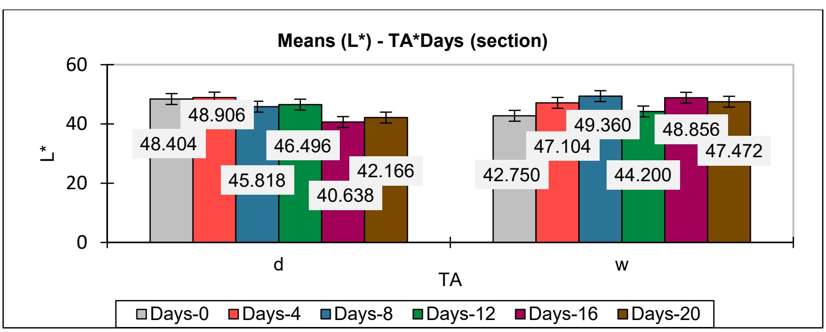

Fig. 8. Mean values of the L* parameter for both wet and dry maturation types in the section of the meat for each of the days when color measurements were taken
L - lightness from 0 to 100; TA- type of aging; d – dry aging; w – wet aging*

The average values for the colorimetric parameter L* in the meat section (Figure 8) showed, for dry aging, a maximum value on day 4 of aging (48.906), followed by slight fluctuations until day 20. The lowest average value of the L* parameter for dry aging was obtained on day 16 of aging. Wet aging, for the same parameter (L*) in the meat section (Figure 8), recorded a maximum average value on day 8 of aging and a minimum value on day 12.

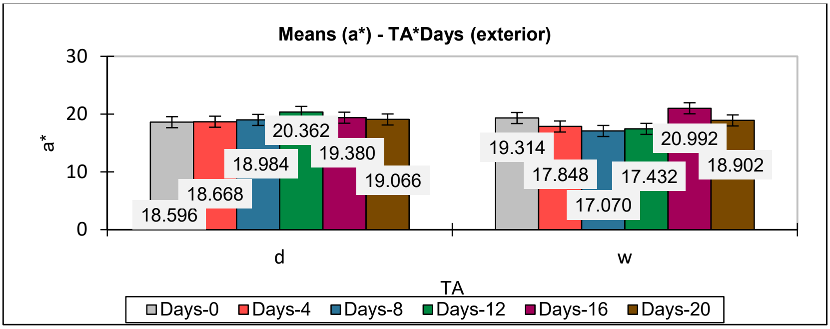

Fig. 9. Mean values of the a* parameter for both wet and dry maturation types on the exterior of the meat for each of the days when color measurements were taken
a - redness (-a* - greenness); TA- type of aging; d – dry aging; w – wet aging*

Dry aging on the exterior of the meat obtained the highest average value for the CIE a* parameter (Figure 9) on day 12 of aging. The increase was gradual from day 0, where the lowest value within dry aging for the CIE a* parameter was obtained, up to day 12, and it decreased slightly until day 20 of aging. Wet aging for the same analyzed parameter on the exterior of the meat (CIE a*) showed successive decreases in the average value from day 0 to day 8, and on day 16, the maximum value (20.992) was obtained, as seen in Figure 9.

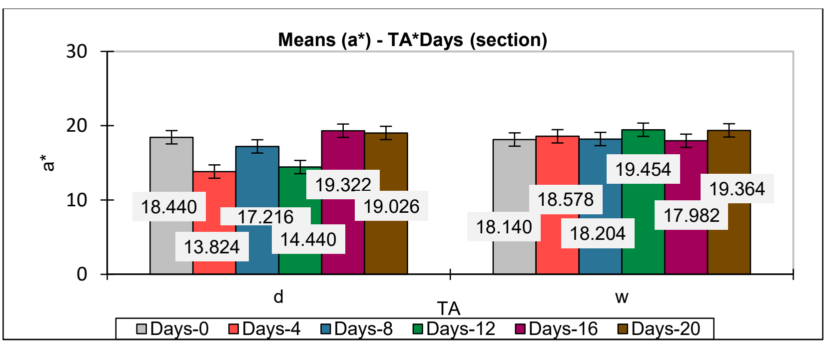

Fig. 10. Mean values of the a* parameter for both wet and dry maturation types in the section of the meat for each of the days when color measurements were taken
a - redness (-a* - greenness); TA- type of aging; d – dry aging; w – wet aging*

The CIE a* colorimetric parameter in the section of pork loin (Figure 10) recorded the highest average value for dry aging on day 16 of aging (19.322) and the lowest on day 4 (13.824). Wet aging registered the maximum average value on day 12 of aging (19.454) for the CIE a* colorimetric parameter, and the lowest on day 16 of aging (17.982). As can be seen in Figure 10, the results for the CIE a* parameter in wet aging were very close.

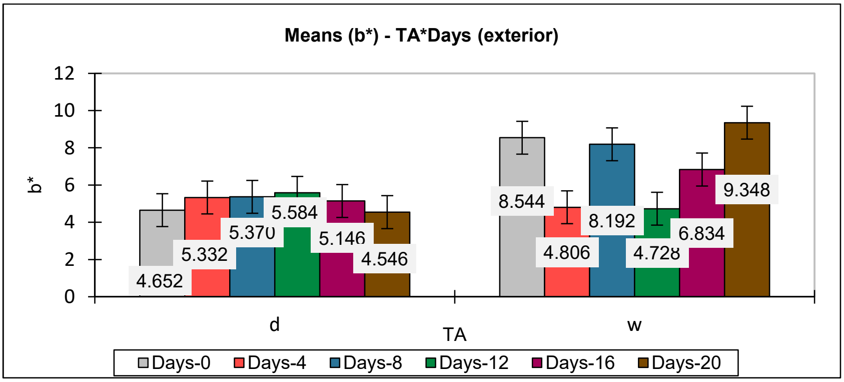

Fig. 11. Mean values of the b* parameter for both wet and dry maturation types on the exterior of the meat for each of the days when color measurements were taken
b - yellowness (-b* - blueness); TA- type of aging; d – dry aging; w – wet aging*

On the exterior of the meat, the b* parameter (Figure 11) presented relatively low average values in the case of dry aging compared to those of wet aging. In the case of dry aging, the results were very close. The maximum average value of the b* parameter for dry aging was recorded on day 12 of aging (5.584), and the minimum average value was recorded on day 20 (4.546). Wet aging had a more significant impact on the average values of the b* parameter on the exterior of the meat, with the maximum average value of 9.348 being recorded on the last day of aging and the minimum average value of 4.728 on day 12 of aging (Figure 11).

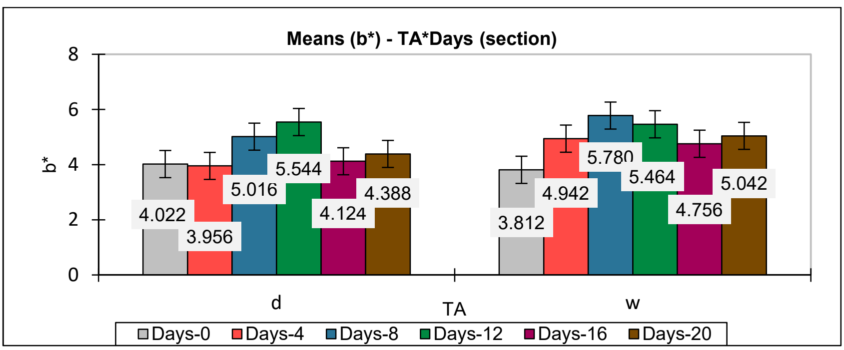

Fig. 12. Mean values of the b* parameter for both wet and dry maturation types in the section of the meat for each of the days when color measurements were taken
b - yellowness (-b* - blueness); TA- type of aging; d – dry aging; w – wet aging*

In the section of the pork loin, the CIE b* parameter (Figure 12) for dry aging recorded the highest average value on day 12 of aging (5.544) and the lowest on day 4 of aging (3.956). In the case of wet aging, the b* parameter in the meat section exhibited a gradual increase in average values until day 12 when the maximum average value (5.780) was obtained. The lowest value for the b* parameter in the meat section for wet aging was 3.812 and was obtained on the day of animal slaughter (day 0).

DISCUSSIONS

As we can observe in Table 1, the type of aging, the progression of aging (aging days), and their interaction had a highly significant influence ($p < 0.001$) on the CIE

L* and CIE b* parameters. Concerning the CIE a* parameter, the type of aging had a significant influence ($p < 0.05$), while the aging days and the interaction type*days of aging exhibited highly significant influences ($p < 0.001$) on meat color.

By using the Tukey's Honestly Significant Difference (HSD) test, differences within the studied CIELAB system parameters (L*, a*, and b*) on the meat's surface based on the type of aging employed (dry or wet) on the designated days for color analysis were observed (Table 1). According to the results obtained from this statistical test presented in Table 1, it can be noted that highly significant differences ($p < 0.001$) were observed for the L* parameter on days 4, 8, and 20 of aging. The b* parameter showed highly significant differences ($p < 0.001$) between the two aging types on days 0 and 20 of aging and significant differences ($p < 0.05$) on the 8th day of aging. Among all the studied parameters, the colorimetric parameter a* was the least affected by the type of aging applied to the meat (dry or wet), exhibiting distinctly significant differences ($p < 0.01$) only on the 12th day of aging.

Dry aging had a higher influence on the average values over the entire aging period for two of the studied CIELAB system parameters, as can be observed in Figure 1 (parameter L*) and Figure 2 (parameter a*), while wet aging more strongly influenced the average values of the b* parameter, as shown in Figure 3. Additionally, the progression of the average values for the CIE L*, CIE a*, and CIE b* parameters on the meat's surface exhibited a gradual increase during dry aging from the beginning until the 8th day for the L* parameter (Table 1 and Figure 7) and until the 12th day for the a* parameter (Table 1 and Figure 9) and b* parameter (Table 1 and Figure 11). This increase was followed by a gradual decrease until the last day of aging, as observed in Figure 7, Figure 9, Figure 11, and Table 1. In the case of wet aging, contrary to the results obtained for dry aging, a gradual decrease was observed from the beginning of aging until the 8th day for the CIE L* (Table 1 and Figure 7) and CIE a* (Table 1 and Figure 9) parameters. The CIE b* parameter exhibited a sinusoidal trend from the beginning until the 16th day of wet aging on the meat's surface, as seen in Figure 11 and Table 1. A sinusoidal trend marked by successive increases and decreases was also observed in the colorimetric parameters L* (Figure 7) and a* (Figure 9) after the completion of the gradual decrease period, which ended, as already noted, on the 8th day of aging on the meat's surface. Dry-aged meat exhibited better color stability and a darker color at the end of aging compared to wet aging, results that are consistent with those obtained by Dikeman M.E. et al. (2013) [13], Kim Y.H.B. et al. (2016) [9], and Li X. et al. (2013) [14].

In the pork loin cross-section, we can observe that the colorimetric parameter CIE a* exhibits highly significant differences ($p < 0.001$) concerning the type of aging, days of aging, and the interaction type*days of aging (Table 2). The CIE L parameter shows highly significant differences ($p < 0.001$) in the interaction between type and days of aging and for days of aging, with significant differences ($p < 0.05$) for the type of aging. Similar to the CIE a* parameter in the cross-section, the CIE b* parameter also presents highly significant differences ($p < 0.001$) concerning days of aging. The type of aging used leads to highly significant differences ($p < 0.001$) in the b* parameter, while the interaction between the type of aging and the progression of aging (type*days of aging) shows non-significant differences ($p>0.05$), as observed in Table 2.

The type of aging used showed more significant differences for the CIE a* parameter in the meat's cross-section than on the surface, as can be observed in Table 2, following the application of the Tukey test. The information obtained from this test revealed highly significant differences ($p < 0.001$) on days 4 and 12 of aging for the two types of aging applied. In contrast, the differences between wet and dry aging were non-significant ($p > 0.05$) for the CIE b* parameter on all days when colorimetric analyses were conducted. The type of aging had a highly significant influence ($p < 0.001$) on the CIE L* parameter only on the 16th day of aging. Additionally, the CIE L* parameter measured in the meat's cross-section was distinctly significantly affected ($p < 0.05$) by the type of aging on days 0 and 20 of aging.

The average values for the CIELAB system parameters recorded over the entire period of wet aging in the meat's cross-section showed higher values for all colorimetric parameters studied, CIE L*, CIE a*, and CIE b*, as can be observed in Figure 4, Figure 5, and Figure 6, compared to the values obtained for dry aging in the cross-section.

The evolution of dry aging in the meat's cross-section showed a slight decrease in the average values for the a* parameter (Figure 10) and the b* parameter (Figure 12) at the beginning of aging. This trend contradicted the values of these parameters in dry aging on the meat's surface, which exhibited a slight increase (Figure 9 and Figure 11). However, the color parameter values for wet aging in the cross-section were lower than the values of the same parameters for wet aging on the meat's surface. Only the L* parameter showed some similarity for dry aging in the meat's cross-section (Figure 8) with dry aging on the meat's surface (Figure 7), with an observed increase in this parameter at the beginning of the aging period. The rest of the dry aging period for the meat's cross-section (Figure 8, Figure 10, and Figure 12) presented results that lacked a certain stability or order (chaotic increases and decreases), similar to the values obtained on the meat's surface for wet aging, for all studied parameters (Figure 7, Figure 9, and Figure 11).

Wet aging in the meat's cross-section (Table 2) exhibited a higher degree of similarity with dry aging on the meat's surface (Table 1) concerning the aging progression, especially for the L* parameter (Figure 7 and Figure 8) and the b* parameter (Figure 11 and Figure 12). Upon analyzing the obtained data, we can observe that wet aging within the meat's cross-section shows a more stable color evolution than dry aging (Table 2). These results contrast with those obtained on the meat's surface for wet aging (Table 1), which is characterized by successive increases and decreases throughout the aging period.

CONCLUSIONS

This study aimed to investigate the influence of two aging methods, dry and wet aging, on the color of pork loin samples, both on the surface and in their cross-section. The study analyzed the effects of aging type, aging duration, and the interaction between these factors on several parameters of the CIELAB colorimetric system (L*, a*, and b*).

The aging type had a much more significant impact on the color on the exterior of the meat samples, with very significant differences ($p < 0.001$) observed in the CIE L* and CIE b* colorimetric parameters. In contrast, the aging type had a highly significant influence ($p < 0.001$) on the CIE a* parameter in the meat's cross-section.

The aging process (the days on which measurements were taken) had a highly significant influence ($p < 0.001$) on all the parameters studied, both on the exterior and in the meat's cross-section. It was the most influential characteristic affecting meat color among all the studied features. In terms of its influence on meat color, the interaction type*days of aging came in second place, significantly influencing ($p < 0.001$) all the analyzed parameters, except for the CIE b parameter in the meat's cross-section, where the results for this interaction were not significant ($p > 0.05$).

Dry aging exhibited better color stability on the exterior of the meat, characterized by an initial period of increasing values of the studied colorimetric parameters, followed by a slight decrease in these parameters towards the end of the aging period. In contrast, wet aging on the exterior of the meat showed generally chaotic increases and decreases in the studied CIELAB color parameters.

Contrary to the results obtained on the exterior of the meat, colorimetric analyses performed in the meat section showed better color stability for wet aging than for dry aging.

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