CHANGES IN OSTRICH MEAT COLOR DURING CURING AS AFFECTED BY pH

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Background

Ostrich meat has become an alternative for healthy eating, as it is claim to be up to 99% fat free, low in calories and cholesterol as well as being high in iron and protein [1,2,3]. Ostrich meat is deep purplish-red and there are few reports regarding changes in color during processing as curing. Meat color influences consumer-buying decision and affects their perception of the freshness of the product; therefore, color alteration can be controlled if factors that affect color are understood. Fresh and cured meat color both depend on myoglobin, but changes in the oxidation state of the heme iron, compounds (oxygen, water or nitric oxide) attached to the iron and pH have great effect on meat color; pH modifies muscle structure and also affects how light is reflected and absorbed affecting the visual appearance [5,6].

Objectives

The aim of this work was to evaluate the effect of the brine pH in the rate of the curing process of ostrich meat.

Methods

Frozen and vaccum packaged ostrich meat muscle (*M. Iliofibularis*) meat was obtained from a local distributor, samples were defrosted at 4°C during 24 hours prior to the curing process. Meat was characterized by proximal analysis, color and myoglobin content. The curing brine was formulated at various pH values by modifying the type of phosphates following a standard brine formula for cooked ham, containing salt, sodium nitrite, sodium erythorbate, phosphates and dextrose, obtained from a local distributor. Meat was cut in small portions, cured by immersion and subjected to an intermittent 15 minutes tumbling followed by 45 min resting periods. Samples were analyzed during curing for pH, nitrites (Griess method), nitrification index by reflectance (NI= R560/R500), Hue and Chroma color parameters using a *ColorFlex* Hunter Lab 11491 system.

Results and discussion

Figure 1 shows the changes in pH during curing by immersion in a curing brine adjusted at various pH's. Meat samples had an initial pH =6.18; during the process pH increased or decreased between 6.1 and 6.7 according to the brine pH, also nitrites increase during time with non-significant differences were detected between pH values. The nitrification index indicates the proportion of myoglobin and nitrosomyoglobin and represents the nitrification efficiency; and it is inversely related to color *ie* higher values indicate a lower proportion of deep-red color, while low values indicate higher proportion bright red color. As can be seen in figure 3 an increment in pH modified color being darker as pH increased that can be objected by consumers. This data is related to the chorma and hue values presented on figure 4.

Conclusions

Variations in pH induce changes in the color of cured ostrich meat being darker as pH increased. This changes are related to the buying decisions and need to be consider for meat distribution and processing.

Pertinent literature

[1]Paleari, M. A., Camisasca, S., Beretta, G., Renon, P., Corsico, P., Bertolo, G., Crivelli, G. (1998) Ostrich Meat: Physico- chemical Characteristics and Comparison with Turkey and Bovine Meat. *Meat Science* **48** (3/4): 205-210.

[2] Sales, J., (1998) Fatty acid composition and cholesterol content of different ostrich muscles. *Meat Science* **49** (4): 489-492.

[3] Sales, J., Navarro, J. L., Martella, M. B., Lizurume, M. E., Manero, A., Bellis, L., Garcia, P. T., (1999) Cholesterol content and fatty acid composition of rhea meat. *Meat Science* **53**: 73-75.

[4] Pomeranz, Y., Meloan, C. E., (1994), Cap 7, Measurement of colour, en Food Analysis. Theory and Practice, 3° edn, Chapman and Hall. U. S. A., pág. 87-98.

[5] Sales, J., Mellet, F. D. (1996) Post mortem pH decline in different ostrich muscles. *Meat Science* **42** (2): 235-238.

[6]Van Jaarsveld, F. P., Naudé, R. J., Oelofsen, W., (1998) Effect of chemical and physical dry-curing parameters on cathepsins B, H and L from ostrich muscle. *Meat Science* **50** (2): 223-233.

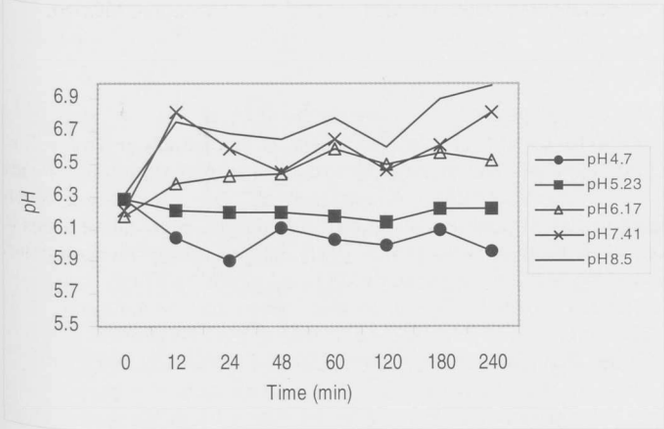

Figure 1. Changes in pH during curing of ostrich meat in relation to the pH brine

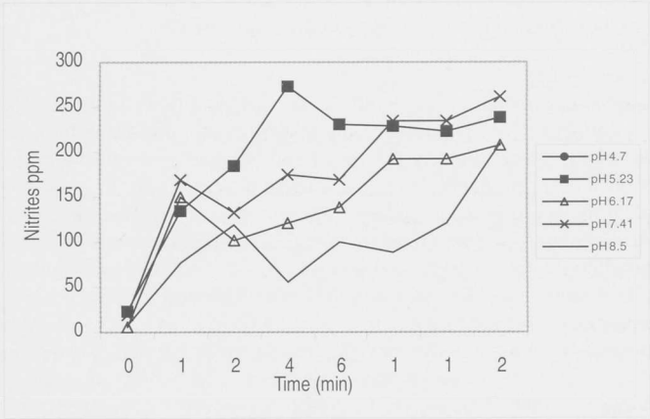

Figure 2. Diffusion of nitrites during the curing of ostrich meat in relation to the pH brine

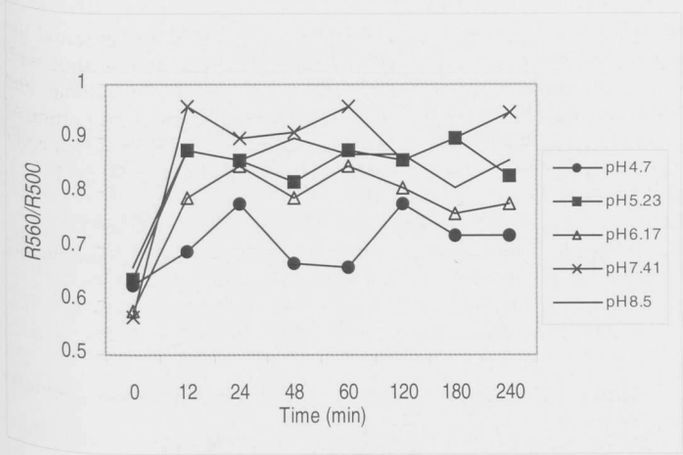

Figure 3. Variation of the nitrification index during the curing of ostrich meat in relation to the pH brine.

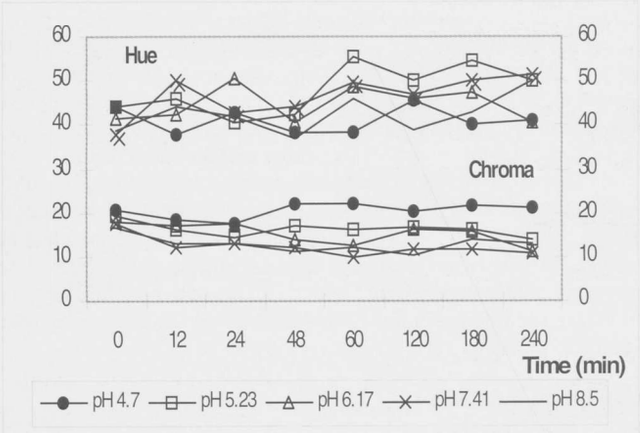

Figure 4. Variation of hue and chroma during the curing of ostrich meat in relation to the pH brine