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pH and aw evaluation of charqui with beef matured and thawed with sodium reduced salt (#405)

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Introduction

Charqui is one of the oldest meat products that is preserved by salting and drying. It is relatively simple to process, has a typical flavor and does not need refrigeration during commercial distribution due to its low water activity (a_w). In addition, dried meat is nutritious (high in protein and low in fat) and stable in storage, still having a high demand as a snack in many countries (Yang et al., 2009). In spite of going through stages that hinder the growth of microorganisms, it can be contaminated during processing (Abrantes et al., 2014).

For its preservation over time, common salt or sodium chloride (NaCl) is used, basic substance for the correct functioning of the organism, used for the enjoyment of flavors and as a natural preservative. Salt also plays an important role in the industrial field as a raw material for many manufacturing processes (Salt Institute, 2017).

At present, an adult recommends the consumption of up to 2 grams of sodium (equivalent to 5 grams of salt) per day (WHO, 2012). Its consumption in excessive amounts is mainly associated with chronic diseases such as hypertension (Rodrigues et al., 2016).

Drying is a natural method where the sun intervenes, although nowadays ovens, tunnels or drums can be used. The packaging must be carried out quickly after drying to protect them from moisture, microbial contamination and insects (Ministerio de Agroindustria, 2016).

The pH is one of the most important parameters evaluated in meat and meat products. From this parameter, it is possible to know the real quality of the product (Campelo et al., 2017).

The objective of the present work was to elaborate and characterize charqui with matured beef with salt reduced in sodium, to determine a_w and pH.

Methods

We worked with three cuts of the posterior quarter: striploin, corresponding to the longissimus lumborum muscle (from the 10th rib to the lumbar vertebrae); eye of round (PG), located on the back of the thigh, which corresponds to the semitendinosus muscle; and sirloin tip (PR), corresponding to the quadriceps femoris muscle. Each cut was divided with a knife in the direction of the muscle fiber in 11 equal portions. They were labeled from 1 to 11 and stored in refrigeration (4 ° C ± 1 ° C). By different maduration days (1 to 90). Granulated salt reduced in sodium (25% less) was added, being covered on both sides with this salt mixture. The dehydration of the sheets was carried out in a controlled oven at a temperature of 70 ° C and an air speed of 1.5 m / s in a period of 16 h.

The evaluation of a_w of the charqui, was done with rashers of 2 mm thick and 4x4 cm of area of each commercial cut of beef in each of the storage times. The a_w was measured in a tank with a Novasina a_w meter at 20 ° C. Three repetitions were made per portion of each commercial cut in each day measure.

The evaluation of the pH of the charqui, was made with rashers of charqui of 2mm of thickness and of 4x4 cm of area of each commercial cut of beef in each one of the times of storage. The pH of the charqui was measured with a pH meter electrode of the punch type, brand HANNA INSTRUMENTS®, model HI 99163 (which will be previously calibrated with buffer). Three repetitions were made per portion of each commercial cut of fresh beef.

Results

Table 1 a_w of beef charqui with sodium reduced salt with different days of ripening, made with cuts of striploin, eye of round y sirloin tip.

Maturation days	Striploin	Eye of round	Sirloin tip
1	0.64^{cd}	0.66^{abcd}	0.66^{bcd}
5	0.64^{cd}	0.52^{ab}	0.67^{bc}
10	0.64^{d}	0.52^{ab}	0.65^{abc}
15	0.58^{ab}	0.62^{abc}	0.67^{bc}
20	0.62^{bcd}	0.53^{ab}	0.68^{c}
25	0.58^{ab}	0.61^{abc}	0.64^{ab}
30	0.62^{bcd}	0.64^{abc}	0.64^{ab}
45	0.61^{abcd}	0.66^{bc}	0.66^{abc}
60	0.60^{abcd}	0.67^{bc}	0.65^{abc}
75	0.59^{abc}	0.68^{c}	0.66^{abc}
90	0.61^{abcd}	0.69^{c}	0.68^{c}

* Different letters are valid for the same column, medians with a common letter are not statistically different (p> 0.05) in the Kruskal Wallis test.

Table 2 pH of beef charqui with sodium reduced salt with different days of ripening, made with cuts of striploin, eye of round y sirloin tip.

Notes

Maturation days	Striploin	Eye of round	Sirloin tip
1	5.68^{abcd}	5.56^{abcd}	5.63^{a}
5	5.68^{bcd}	5.57^{bcde}	5.66^{abc}
10	5.65^{bcd}	5.62^{bcde}	5.59^{a}
15	5.64^{abcd}	5.67^{de}	5.73^{abcd}
20	5.48^{a}	5.54^{abcd}	5.74^{bcd}
25	5.69^{cd}	5.54^{abc}	5.66^{abcd}
30	5.66^{bcd}	5.64^{cde}	5.68^{abc}
45	5.65^{abcd}	5.58^{abcd}	5.64^{ab}
60	5.52^{ab}	5.58^{abcde}	5.49^{a}
75	5.64^{abc}	5.49^{ab}	5.76^{bcd}
90	5.50^{ab}	5.28^{a}	5.87^{cd}

* Different letters are valid for the same column, medians with a common letter are not statistically different (p> 0.05) in the Kruskal Wallis test.

Conclusion

In the charqui made with eye of round the lowest aw was obtained 0.52. In the case of pH, the smallest value was eye of round with 5.28. Being favorable for its implementation in the food industry.

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Notes