EFFECT OF „VITMEAT-C" PREPARATION ON COLOUR CHANGE AND STABILITY OF "BOLOGNA" TYPE SAUSAGE

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Background

The principal objective for using selected technological additives is to improve and to stabilize the high quality of meat products. All expectations related to better quality and the extend of stability are well fulfill by sodium lactate used in proper amount (Brewer et al., 1993, Yang et al, 1993). This substance is a product of natural lactic fermentation and its use doesn't be controversial. In majority of countries the sodium lactate is used in amounts resulted from rules of the Good Manufacturing Practice (GMP) to achieve the assumed technological effect, it means to inhibit development of microorganisms. For consumers, however, colour stability is an equal important criterion by which they evaluate meat products. Ascorbic acid is normally used to create an optimal and stable colour of meat products, but applied in improper amounts may cause undesirable changes of this property (Hvoslev, 1982, FAO/WHO Report, 1991, Smith, 1991).

Results presented in this study illustrate changes of colour and stability of "bologna" type sausage manufactured by the use of blends contained sodium lactate and ascorbic acid.

Objective of study

The objective of this study was checking the possibility of application of the selected blends contained sodium lactate and ascorbic acid for improvement of colour and stability of "bologna" type sausage.

Material and methods

Experimental "bologna" type sausage produced under commercial conditions in meat processing plant MRÓZ in Borek, Poland was the subject of the study. The sausage (1) contained "Vitmeat-C" preparation commercially made by AKWAWIT SA in Leszno, Poland as a mixture of sodium lactate and ascorbic acid added in amount ensured their contents in the final meat product equal to 2 % and 0.05 % , respectively. The control sausage (0) was produced without these additives. After production procedure all sausage samples were stored under chilling conditions (2-4°C). Control tests were done 2, 6, 10, 13 and 17 days after production. Changes of total aerobic mesophilic bacteria count was determined according to the Polish Standard No A-82055-6.

Colour attributes (L*,a* and b*) of meat product were evaluated using the SPECTRO-PEN apparatus (Dr Lange Co, Germany) due to procedure given in the manual . Colour changes of meat products were sensoric evaluated by panel of experts using graphical method (maximum score equal to 10 points). The evaluation was carried out immediately after cutting sausage sample and 1 hour later . Data collected during experiments were analyzed statistically.

Results and discussion

Based on data collected during this study it was found, that all examined sausages made under commercial conditions demonstrate good initial sensoric quality. Rate of changes related to the lost of freshness results from activity of remaining microorganisms (Frazier et al, 1978, Tyszkiewicz, 2000).

The stability of examined sausages were evaluated on the base of changes of aerobic mesophilic bacteria count. Figure 1 illustrates results of these investigations. The addition of "Vitmeat-C" preparation significantly inhibited the dynamic of microorganisms development which resulted both from sodium lactate as well as ascorbic acid influences.
Common activity of both compounds is connected with changes of pH values in both examined sausages (Figure 2).

Evaluation results of colour attributes indicated that the dynamic of storage changes of the a* and b* parameters determined individually is similar for both of examined sausages. Slight variation of results were observed in case of brightness (L*) only. Marked differences were found by calculation of obtained results to the synthetic parameter, it means $C^* = \left[(a^*)^2 + (b^*)^2\right]^{0.5}$ (McLaren 1980).

The addition of "Vitmeat – C" preparation demonstrated the significant influence onto differentiation of pigment nitrosation for both of examined sausages (Figure 3). A desirable influence of ascorbic acid addition on amount of nitrosoheme pigments was observed . In the same time the amount of free nitrites was reduced what is important from nutritional point of view .

For consumers, the most important results represents data of sensoric evaluation of experimental sausages. Among examined features the most important property is colour acceptance as presented on Figure 4 . Each variant of sausage manufactured with addition of „Vitmeat –C" preparation was evaluated statistically higher in comparison to the control sausage samples. Especially important is a fact, that the addition of this preparation allows to improve high significantly the colour of meat product after its exposure to daily light during 1 hour. In case of the evaluation of other colour attributes and in particularly their brightness and typicality, the positive effect of this preparation was also observed. Results of sensoric evaluation indicate higher differentiation of obtained data in comparison to results of instrumental evaluation.

Conclusions

1. The quality of all sausages examined 2 days after production was evaluated as good.
2. The presence of 2% „Vitmeat – C" preparation in sausage formula efficient inhibited the development of aerobic mesophilic bacteria.
3. The type of sample, storage time and high exposure time significantly affected on psychometric saturation of colour of meat products
   expressed as C* - value .
4. The colour acceptance of "bologna" type sausage contained "Vitmeat-C" preparation was higher then of the control one.

References

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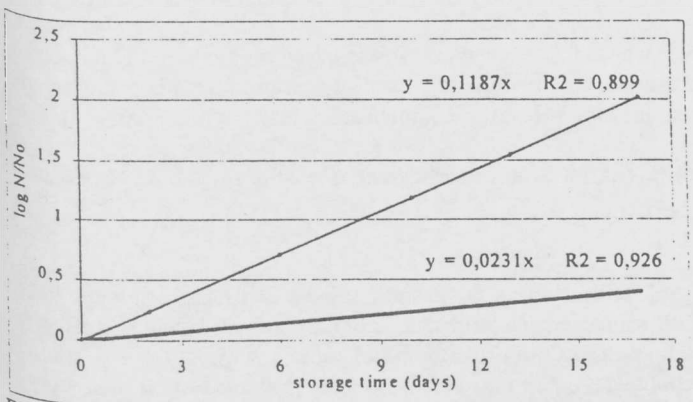

Fig. 1 Changes of total aerobic mesophilic bacteria count expressed as logN/No

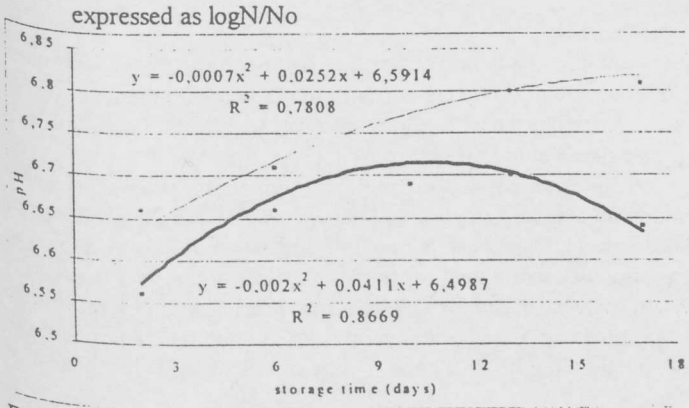

Fig. 2 Changes of pH -value during storage of experimental sausages

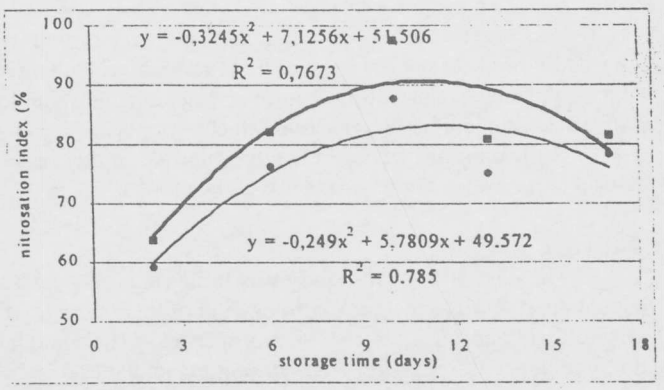

Fig. 3 Changes of nitroso-pigments amount related to total amount of pigments (%)

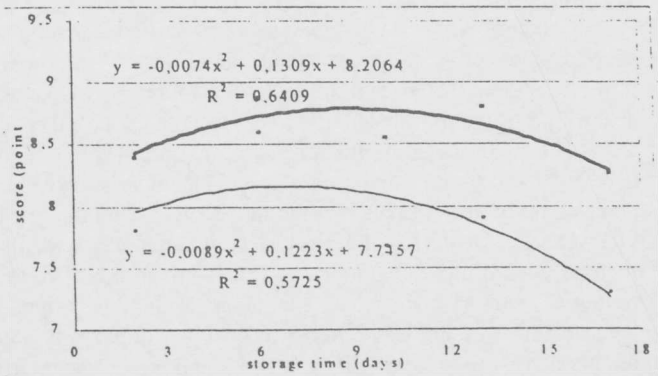

Fig. 4 Change of colour acceptance determined directly after cutting of sausages (max score = 10 points)

Description for all figures: —— - control sample, —— - experimental sample