COLOUR PARAMETERS EVOLUTION DURING CHORIZO LIGHT EXPOSURE

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SUMMARY

"Chorizo" is a well known spanish dry-sausage. In this work chorizo slices made with tocopherol added to paprika was exposed to light, to evaluate the evolution of colour parameters (CIEL*a*b*). Regression equations were obtained for these parameters. Light exposure enhances the decrease in lightness. Redness is the only colour parameter that is protected by tocopherol added to paprika. "Chorizo" light exposure shows the typical fading of dry-cured products.

INTRODUCTION

"Chorizo" is the most popular and typical Spanish dry fermented sausage with more than 20 varieties described (Spanish Ministry of Agriculture, Fisheries and Food, 1983).There exist few works about the relationship between the organoleptic characteristics and the physicochemical, enzymatic and biologic reactions that take place during the curing process. These studies make possible the improvment of the technological process and the conservation of sausages. Colour is one of the most important quality characteristics determining the consumer's evaluation and acceptance (Smulders et al.,1989; Palombo et al.,1989; Hunt et al,1992).It is important to study the evolution of the colour parameters in the meat products. The sausages are exposed to light during comercialization and this produces decolouration. The colour instability is directly related with the carotenoids paprika oxidation.The most important spice in this sausage. Is well know the sodium nitrite effect in the color development in meat derivatives. Nitrites contribute to the nitrous myoglobin formation (pink red color). This pigment is responsible for the characteristical colour of cured products. The sodium nitrite increases the instability of the carotenoids (O. Gorospe, J. M. Sanchez-Monge and J. Bello,1986). Usually, the commercial sausage has incorporated chemical additives. The product's colour is stabilized by these additives during the shelf life. However to obtain hight quality products and to reduce the toxicity, it is recomendable to use low additive concentrations. The tocopherol reduce the paprika decoloration. There is no study about this antioxidant effect (In meat products).

The aim of this work was to study the effect of differents concentrations of paprika with added tocopherol upon colour properties during "Chorizo" comercialization exposed to different light intensities (0,300,1000,2000 lux) during a week.

MATERIALS AND METHODS

The "Chorizo" samples were prepared according to usual practice in a commercial meat plant were prepared. Three "Chorizo" batches were prepared. One batch was made with paprika without tocopherol as a control. The other 2 batches were made with different tocopherol concentrations added to paprika (100 and 500 ppm) respectively. "Chorizos" were cut in slices with 2 cm widen.

The "Chorizo" slices were placed in an iluminated display cabinet to simulate commercial conditions. The samples were iluminated continuously with Osram L36/76 nature de lux lamps at different light intensities 0, 300, 1000 and 2000 lux (2-4°C,RH 80%) during 7 days. The samples were analized daily. The colour parameters under study were CIE L*a*b* (observer 10°, D-65 illuminant), L*(lightness), a*(redness), b*(yellowness), C*(chroma), h°(hue), CIE notations 1976. All of these parameters were measured by a Milnolta CM1000 R spectrophotometer.

The statistical analysis were made with BMDP softwere and 1 R linear regression.

RESULTS AND DISCUSSION

Colour parameters evolution during light exposure of "chorizos" made with tocopherol added to paprika were study. The results obtained were analyzed by a linear regression program (1R) and are showed in table 1. All samples with 500 ppm tocopherol added to paprika was lower in lightness (equation nº2, table 1) than the others. This is probably due to the influence of tocopherol oil matrix upon paprika, because this spice shows more opacity than the others (Figueroa et al., 1993). All samples decreased during the period under study, but this was notorious in samples exposured to light. This decrease could be due to by sample dehydration (Illescas et al., 1993). Protective effect upon fading in samples with tocopherol added to paprika was observed for redness (high concentration high protection) (figure 1). For all treatments a* (equation nº2, table 1) decreased and this is in agreement with fading patterns of meat products (Hunt et al., 1991). This protective effect upon redness is in agreement with tocopherol influence upon ultraviolet light exposured (Figueroa et al., 1993). The behaviour of the yellowness (equation nº 3, table 1) was independent of light and treatment, but a decrease in time was observed. This product follows the typical fading of dry-cured products: a* decreased, b* decreased (Rodríguez et al., 1992; Illescas, et al. 1993).

The same evolution in tocopherol added to paprika exposed to ultraviolet light was observed, however in the dark b* was constant (Figueroa et al., 1993). Therefore the decrease in this parameter could be due to the oxidative rancity of fat (Rodríguez et al., 1992).

In figure 2 colour tone was represented for "chorizos" exposed to light (300 lux and 100 ppm tocopherol added to paprika) and kept in the dark. The samples exposed to light showed a darker colour than samples in darkness. For all tocopherol concentrations similar evolution was observed.

The low coefficient correlation could be due to the heterogeneous fat and meat distribution in this product.

CONCLUSIONS

Light exposure enhances the decrease in lightness. Redness is the only colour parameter that is protected by tocopherol added to paprika. "Chorizo" light exposure shows the typical fading of dry-cured products.

REFERENCES

-FIGUEROA M.V.;PAGAN M.J.;PEREZ J.A.;ARANDA V.,1993."Efecto del tocoferol sobre la estabilidad del pimentón a la luz ultravioleta y temperatura". Anales del Master en Ciencia e Ingeniería,vol.3,169-185.

-GOROSPE O.,SANCHEZ-MONGE J.M.,BELLO J.,1987."Efecto del pH, del nitrito sódico y de aniones presentes en los embutidos crudos-curados sobre la estabilidad de los colorantes del pimentón (*Capsicum annuum* L.)".Rev. Agroquím. Tecnol. Aliment.,27,120-128.

-HUNT M.C.,ACTON J.C.,BENEDICT R.C.,CALKINS C.R.,CORNFORTH D.P.,JEREMIAH L.E.,OLSON D.P.,SALM C.P.,SAVELL J.W.,SHIVAS S.D.,1991."American Meat Science Association Committee on Guidelines for Meat Color Evolution",Proceedings of 44th Annual Reciprocal Meat Conference.Ed American Meat Science Association, National Live Stock and meat Board.June 9-12 Kansas State University.Manhattan,K.S.

-ILLESCAS E.A.,ARANDA V.,PAGAN M.J.,PEREZ J.A.,1993."Estudio del efecto de la oscuridad sobre muestras de jamón curado loncheado expuestas a diferentes intensidades de luz y temperatura".Anales del Master en Ciencia e Ingeniería,vol.3,563-578.

-PALOMBO R.,VAN ROON P.S.,WIJNGAARDS G.,PRINS A.,1989."Kinetic analysis of changes in lightness atribute of colour during the processing of comminuted meat product".Proceedings of 35th International Congress of Meat Science and Technology,Copenhage,624-631.

-RODRIGUEZ A.,PEREZ J.A.,SAYAS M.E.,PAGAN M.J.,GAGO M.A.,ARANDA V.,1992."Colour and colour stability of dry cured ham". Proceedings of 38th International Congress of Meat Science and Technology,Clermont-Ferrand,583-586.

-SMULDERS F.J.M.,VAN LAACK R.L.J.M.,1989."Colour and colour stability of hamburgers prepared from electrically stimulated,hot vs cold boned,closely trimmed beef".Proceedings of 35th International Congress of Meat Science and Technology,Copenhage,815-818.

-Spanish Ministry of Agriculture,Fisheries and Food,1983."Catalogo de embutidos y jamones curados de España",Madrid.