Evaluation of the textural properties of cream ice cream with partial substitution of powdered milk for quinoa flour

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The increase in the consumption of plant-based foods, coupled with the preference for nutritious, healthy and sustainable foods is a reality, and the markets must be prepared to meet this demand. The usual composition of cream ice cream, a product with high global demand, has been partially and/or totally modified through the use of legume and/or Andean grains, seeking to meet criteria such as new food trends, the absence of compounds that can generate adverse reactions in the consumer, environmental commitment and of course benefits not only nutritional but also for health. Quinoa, an ancestral grain of Andean origin, is an exceptional food, recognized for its nutritional quality and the presence of bioactive compounds, as well as for its adaptation to various climatic conditions. Its partial use in cream ice creams makes it possible to reduce some undesirable compounds (lactose, saturated fats) and incorporate new ones that are beneficial (fiber, phenolic compounds, phytosterols) and that are not found naturally in this product. The present investigation evaluated the effect of substituting skimmed milk powder for quinoa flour of Rosada from Huancayo and Pasankalla varieties, on the proximal composition, overrun, hardness, melting speed and viscosity of an ice cream with the incorporation of Lactobacillus casei. The evaluation was carried out during 28 days of storage (-18 °C). In each one of the flour substitutions of 25, 50 and 100% were made, and a control was also made. The results indicated an increase in the content of unsaturated fats, carbohydrates and crude fiber respect to the control, this being higher in the case of the Pasankalla variety. A significant effect of quinoa flour concentration on overrun, viscosity and melting rate ($p<0.05$), but not on hardness, was observed when the treatments were compared with the control. The use of quinoa flour reduced the content of saturated fat and lactose, and added fiber to the ice cream. The overrun and the fusion speed were affected, generating an increase in hardness, although the latter was not significant.

Keywords: Quinoa, Pasankalla, Rosada de Huancayo, ice cream, hardness, viscosity, overrun