

PREPARATION AND PROPERTIES OF PROCESSED CHEESE SPREAD CONTAINING QUINOA PASTE BY

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(Accepted, 30/7/2017)

SUMMARY

Quinoa paste (Qp) was used to substitute 10, 20, 30 and 40% of the cheese base in the manufacture of processed cheese. The resultant products were analyzed for some of its physicochemical, microstructural and textural properties. The basic blend of processed cheese spread (PCS) contained 42% dry matter (DM) and 44% fat/DM. The dry matter (DM) and fat/DM contents of the obtained product were not affected by the addition of quinoa paste Qp, while the fiber, total carbohydrate contents and the pH value were significantly increased ($p < 0.05$), and the protein, ash, salt, and the soluble nitrogen (SN) contents and total volatile fatty acids (TVFA) were significantly ($p < 0.05$) decreased.

Texture profile analysis (TPA) indicated an increase in the hardness of PCS and decreased in Cohesiveness; springiness; gumminess and chewiness with the increased level of the added QP. Also, PCS exhibited low oil separation index (OSI) and low meltability with the increased of QP in the cheese formulation.

The obtained PCS for all treatments was organoleptically acceptable. The use of up to 30% QP in the manufacture can be recommended to reduce the cheese cost.

Key words: processed cheese, quinoa, microstructural, textural properties

INTRODUCTION

Processed cheeses are among the highly cheese varieties appreciated by consumers, whereas, the Egyptian dairy industry produces about 132,081 ton per year (CAPMS, 2016). In response to the increased manufacturing costs, 'imitation' processed cheese products have been developed and are widely used, in pizza and fast food outlets, by the catering trade, in formulated foods and in school lunch programmes (Shaw, 1984). 'Imitation' processed cheese is made from mixtures of dairy and/or nondairy proteins and fat/oils.

Non-dairy ingredients have been used in processed cheese for many dietary and economic reasons. El-Neshawy *et al.* (1988) manufactured processed cheese of high protein content from blends of Cheddar cheese, whey protein concentrate (WPC), soya bean protein concentrate (SPC) and chick pea flour (CPF). Other manufacturers of imitation cheese have used modified starches or soy isolates and gelation as casinate replacement (Kiely *et al.*,

1991). Whereas, starches significantly reduced the cheese firmness compared to the control with potato starch having the greatest effect. Rice starch appears to have the most potential replaces for casein in imitation cheese (Mounsey & O'Riordan, 2001).

Quinoa (*Chenopodium quinoa* Willd.) is a pseudocereal native to South America. It has been an important staple food in the Incan civilization and has been cultivated in the Andean highlands since 3,000 BC. In the Quechua language of the Incas, quinoa is the *chisya mama* or "mother grain" and is nowadays also called Incan rice (National Research Council, 1989). However, in the recent years, quinoa has attracted renewed interest thanks to their high nutritional value. Quinoa has recently been used as a novel functional food because of its properties (Abugoch, 2009). Andean grains, in particular quinoa, have been recognized as a complete food as it has higher protein content and a better balanced protein