

## **Application of Microparticulated Whey Proteins in Reduced-Fat Yogurt through Hot-Extrusion: Influence on Physicochemical and Sensory Properties**

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**Abstract :** Fat reduced dairy products are holding a potential market due to health reason. Due to less creamy, and pleasantness, reduced and/or low-fat dairy products are getting less consumer acceptance whereas the fat molecule provides smooth, creamy and a pleasant mouthfeel in dairy products especially yogurt & ice cream. This study was aimed to investigate whether the application of microparticulated whey proteins (MWPs) processed by extrusion cooking, the reduced fat yogurt can achieve similar or higher creaminess compared to whole milk (3.8% fat) and skimmed milk (0.5% fat) yogurt. Full cream and skimmed milk were used to prepare natural stirred yogurt, as well as the dry matter content, also adjusted up to 16% with skimmed milk powder. Whey protein concentrates (WPC80) were used to produce MWPs in particle size of  $d_{50} > 5 \mu\text{m}$ ,  $d_{50} 3 < 5 \mu\text{m}$  and  $d_{50} < 3 \mu\text{m}$  through the hot-extrusion process with a screw speed of 400, 600 and 1000 rpm respectively. Furthermore, the commercially available microparticulated whey protein called Simplese® was also applied in order to compare with extruded MWPs. The rheological and sensory properties of yogurt were assessed, and data were analyzed statistically. The applications of extruded MWPs with 600 and 1000 rpm were achieved significantly ( $p < 0.05$ ) higher creaminess and preference compared to the whole and skimmed milk yogurt whereas, 400 rpm got lower preference. On the other hand, Simplese® obtained the lowest creaminess and preference compared to other yogurts, although the contribution of dry matter in yogurt was same as extruded MWPs. The creaminess and viscosities were strongly ( $r = 0.62$ ) correlated, furthermore, the viscosity from sensory evaluation and the dynamic viscosity of yogurt was also significantly ( $r = 0.72$ ) correlated which clarifies that the performance of sensory panelists as well as the quality of the products.

**Keywords :** microparticulation, hot-extrusion, reduced-fat yogurt, whey protein concentrate

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