Title : Ability of acacia gums on stabilization of coconut milks when comparing to Tween

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Abstract

Coconut milk is one of the ten important exported organic agricultural products of Thailand (Press release THAIFEX-World of Food Asia, 2009). To delay creaming instability due to lack of sufficient emulsifiers and heating process, the addition of acacia gum (4, 6, 8, 10 wt%) has been done and investigated their effect onto stability of coconut milk emulsions and was to compare with the ability of Tween-stabilized emulsions. Fresh coconut milk (32 ± 1.59% fats) was purchased from local market and immediately preheated at 80°C before use. Stabilized coconut milks prepared by adding two different manufactures (Thai pure science Co., Ltd and Jumbo Trading Co.,Ltd.) of acacia gum and of Tween 60 and Tween 80 were homogenized using rotor-stator homogenizer. The rheological properties, coarse oil droplet size, particle size determination, and creaming index were determined for non-sterilized and sterilized coconut milk emulsions.

Fresh coconut milk showed relatively small coarse oil droplet size (3.41 μm) with low dynamic viscosity of 18.4 mPas. The homogenization process were then applied which fairly reduced coarse oil droplet size (3.09 μm) of the coconut milk. The rheological properties of acacia gum solutions and Tween solution were also investigated. The results showed that no differences in dynamic viscosities between two differences acacia gum (TPS and Jumbo) were found. As expected, increasing in acacia gum concentration markedly increased dynamic viscosities of solutions in exponential tendency. All solutions were best described by Newtonian behavior. When the acacia gum and Tween solutions were added into coconut milk emulsions, higher stability by delay creaming index was obtained. From the results found in this experiment, creaming index (%) of acacia gum-stabilized emulsions showed lower than that of Tween. Lowest creaming index has been found in coconut milk mixed with 10% acacia gum (TPS). This due to high effective viscosity was produced by adding acacia gum (TPS). As well, for amplitude sweep and frequency sweep, only emulsions prepared form acacia gum (TPS) showed the solid-like property ($G' > G''$). After sterilization, the creaming index was unexpectedly lower than non-sterilized samples after stored for 7 days even if coarse oil droplet size of the sterilized samples were bigger than non-sterilized. The reason might be due to the bridging flocculation by acacia gum has been occurred and induced the stability in coconut milk emulsions.