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Textural and sensory properties and gel microstructure of set-yoghurt made of indigenous and exotic cow milk

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Distinctive milk composition variations have been identified among indigenous cattle and high-yielding exotic cattle breeds. A better milk compositional profile leads to dairy products with enhanced technological and functional properties. The current study was performed to assess the textural, microstructural and sensory properties of set-yoghurts produced using milk from two indigenous cattle types (Thamankaduwa White [TW] and Lankan cattle [LC]) and two exotic cattle breeds [Friesian and Jersey]. Set-yoghurts were made by inoculating commercial starter cultures composed of *Streptococcus thermophilus*, *Lactobacillus delbrueckii* ssp. *bulgaricus* and *Bifidobacterium animalis* ssp. *lactis* (BB-12). Instrumental texture profiles and scanning electron micrographs (SEM) of set-yoghurts during 21 days of refrigerated ($4 \pm 1^\circ\text{C}$) storage were evaluated. Sensory attributes were evaluated with 40 untrained panelists using a five-point hedonic scale. Set-yoghurts made from indigenous cow milk showed higher ($p < 0.05$) firmness, cohesiveness and apparent viscosity compared to those prepared using exotic cow milk. As revealed by micrographs, set-yoghurts made from TW milk had fewer and smaller void spaces and a dense protein gel network, while gel made from Friesian cow milk resulted in a weaker gel than the other milk gel types. The sensory analysis revealed that set-yoghurts made of TW milk had the highest ($p < 0.05$) sensory scores for all sensory attributes, while set-yoghurts made of Friesian milk had the lowest ($p < 0.05$) sensory acceptance. Overall results suggest the importance of using indigenous cow milk in producing set-yoghurts. These approaches may also provide a promising way to strengthen indigenous cattle farming, avoiding the genetic erosion of valuable indigenous breeds.

Keywords: *Firmness, Instrumental texture, Sensory analysis, Viscosity.*