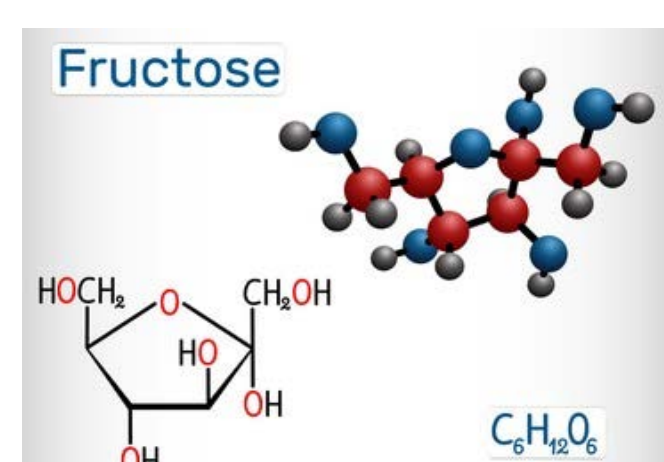




RHEOLOGICAL PROPERTIES OF CELLULOSE FAT MIMETIC WITH THE ADDITION OF FRUCTOSE SWEETENERS

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Vivapur MCG 611F
colloidal microcrystal cellulose (MCC 81,2–88,7%)
coated with sodium carboxymethyl cellulose
(NaCMC–cellulose gum, 11,3–18,8%).



Ultraturaks T-25, Janke Kunkel, S25 N-18G accessory, at a rotation speed of 6500 rpm.



Hydrated particles form soft, spherical aggregates, physically similar to the globular structures of fat and simulate the desired functional and sensory properties of fat.



MCG fat mimetics (1,3,5,7,10%)



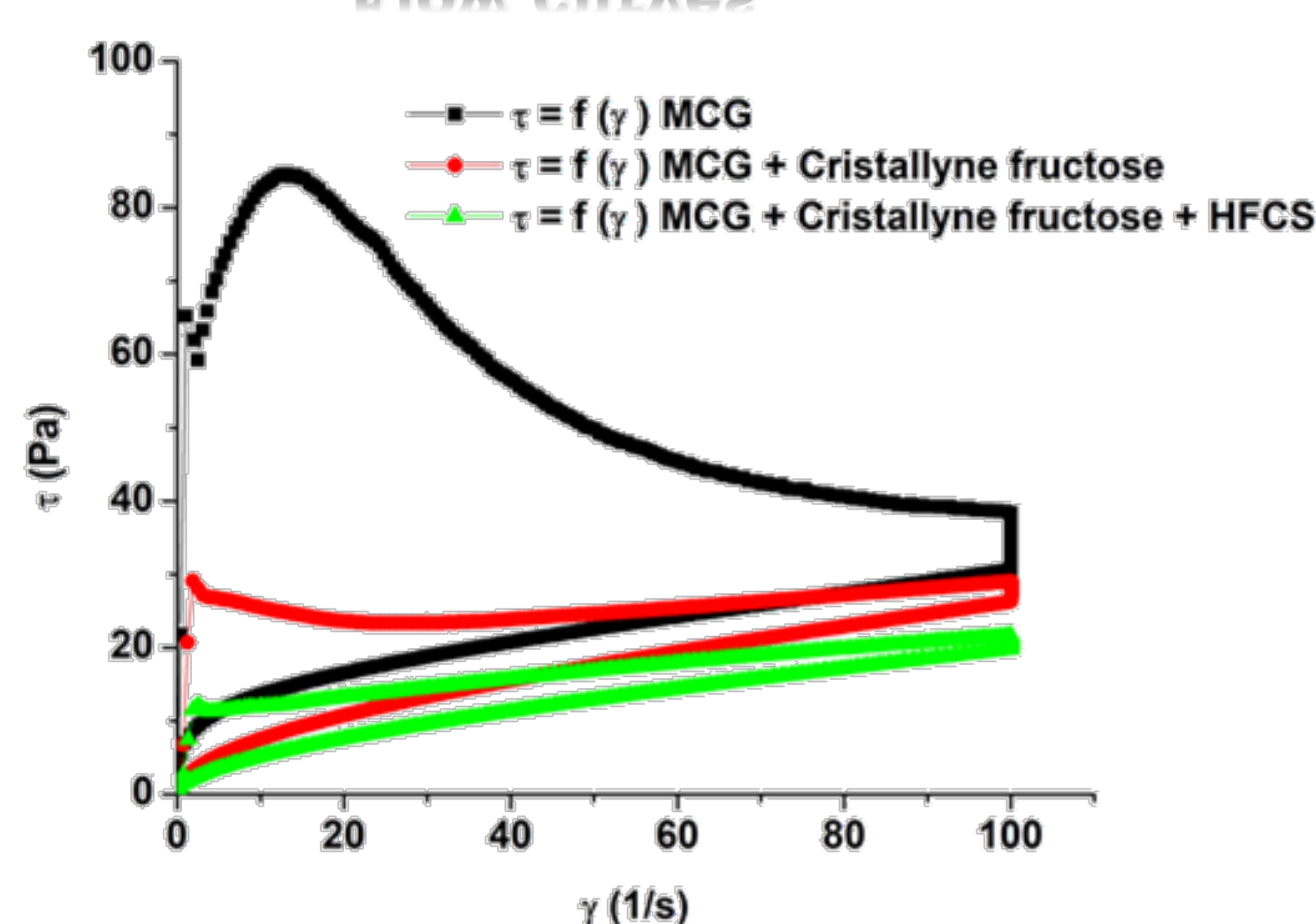
The combination of fat mimetics and starch sweeteners is applicable in low-energy and low-fat products. In this paper, the influence of fructose sweeteners on the rheological and textural characteristics of MCG 611F fat mimetic with different concentrations (1, 3, 5, 7 and 10%) was analyzed. The amount of sweetener in the mixture with the fat mimetic was 20%. The effect of pure crystalline fructose and a mixture of crystalline fructose and high fructose corn syrup in a ratio of 1:1 was investigated.

RHEOLOGICAL PROPERTIES

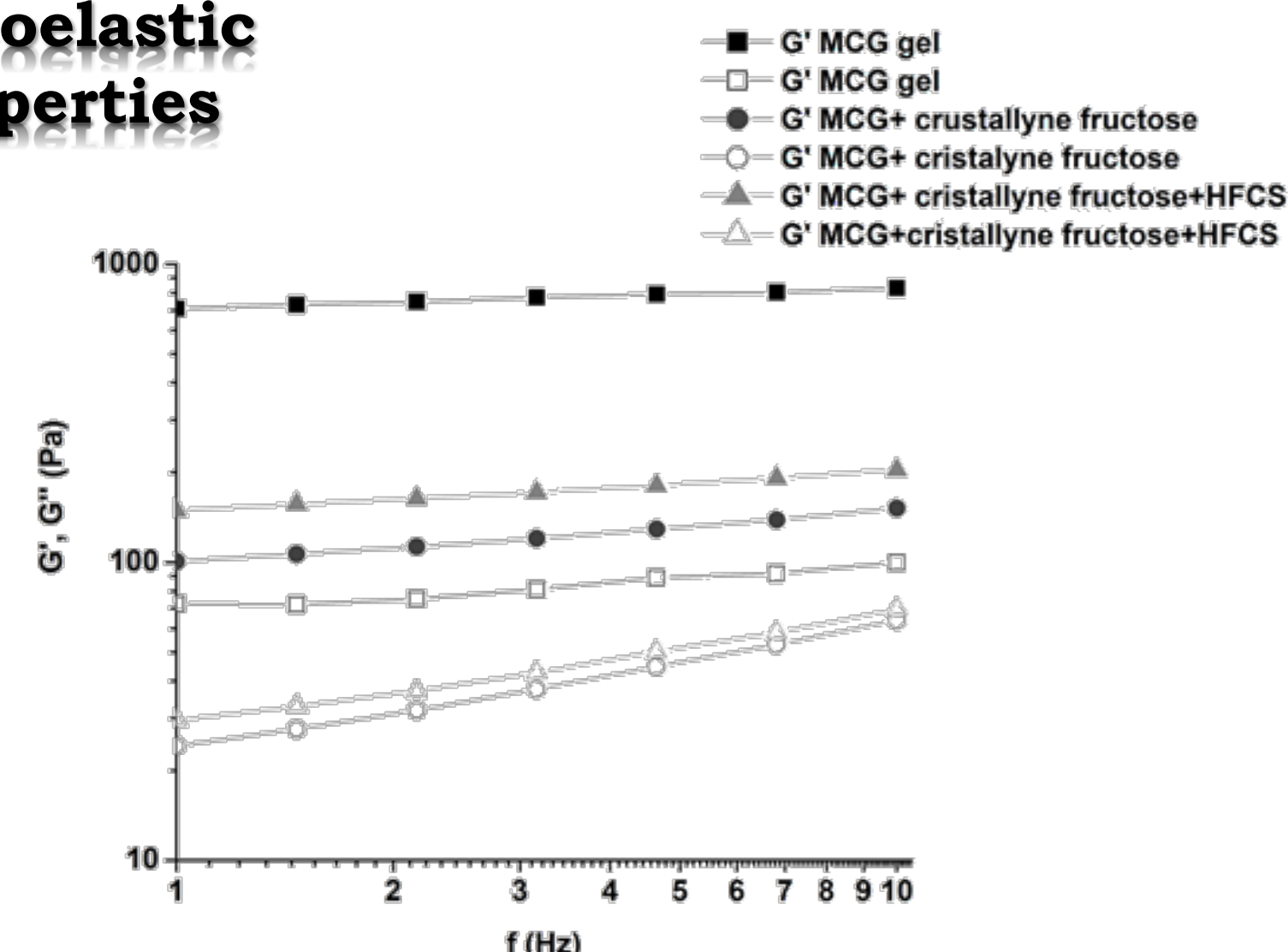


Haake Rheostress 600

Flow curves



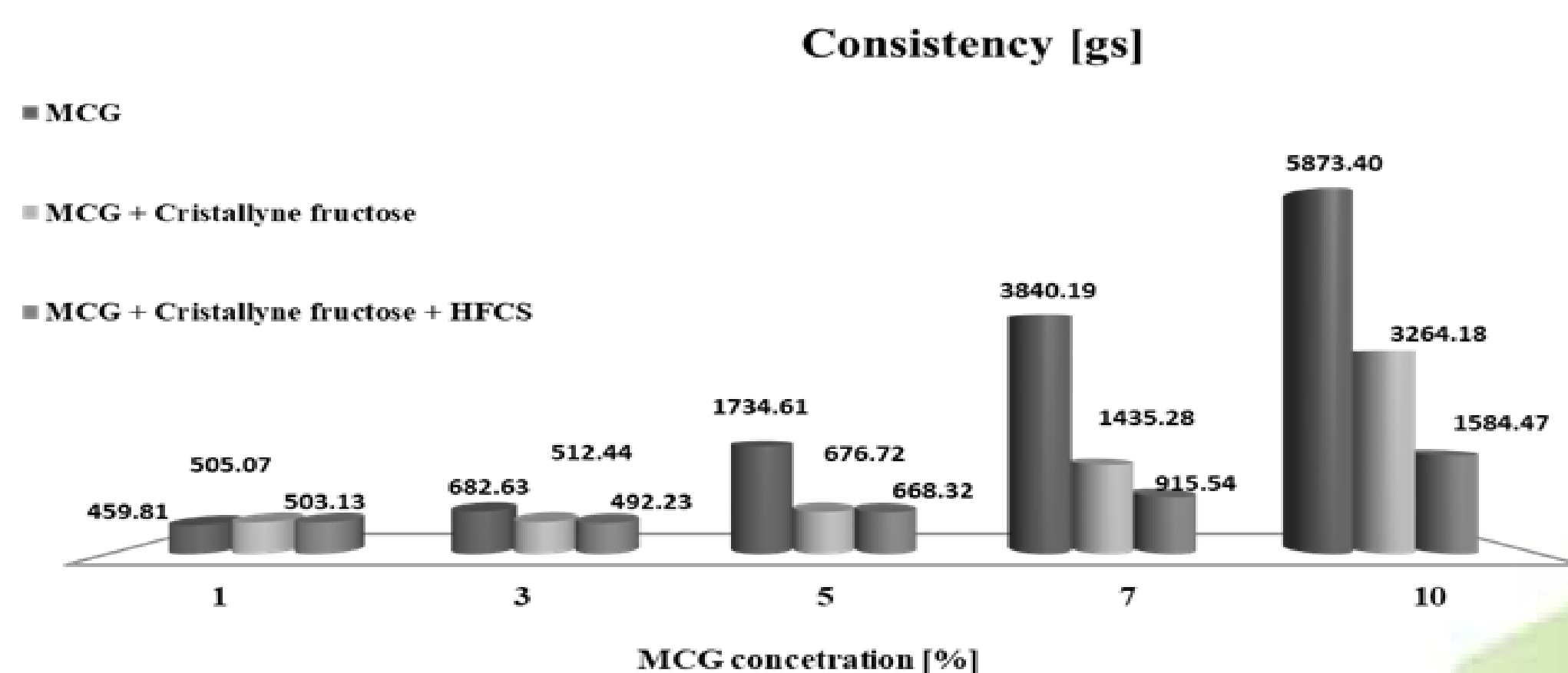
Viscoelastic properties



TEXTURAL PROPERTIES



Texture analyser TA.HD Plus



- ✓ With the addition of pure crystalline fructose, the values of the rheological parameters: the yield stress, τ_0 , decreased for 41.35–77.84%, and the thixotropic loop area, A_0 , for 70.39–78.93%. By adding a mixture of sweeteners, this decrease was increased additionally for 10% for both rheological parameters.
- ✓ At higher gel concentrations of 5, 7 and 10%, the dominance of the elastic modulus G' was preserved. Accordingly, the texture parameters: consistency, hardness, cohesiveness and viscosity index were reduced.

CONCLUSION:

Summarizing, the presence of sweeteners significantly disturbed the crosslinking of the three-dimensional structure of the MCG gel. The more pronounced effect of the sweetener mixture is a consequence of the lower dry matter content (71%). These negative effects of sweeteners on the rheological and textural properties of fat mimetic gels can be avoided by the correct order of addition of raw materials in production and by enabling hydration of the gel before the addition of small molecule components.