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• Understanding of the relationship between the microstructure of colloidal systems and their in-use and in-body functionality.

Communication aspects related to the application of colloidal systems in innovative functional food formats will be also discussed.

ENERGY AND EXERGY ASSESSMENTS OF FRUIT PULP PRODUCTION PROCESS

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Thermodynamics plays an important role to carry out the performance analyses of the industrial processes. Energy analysis is the basis of the heat-balance method that is commonly used in energy systems performance analysis. Exergy analysis identifies more clearly than energy analysis the causes and locations of thermodynamic losses. Exergy analysis also assists in improving and optimizing designs. From this point of view, this study presents the energy and exergy assessments of the peach pulp producing process by using the operational data from Goknur Fruit Juice Plant, Turkey. All stages in peach fruit pulp production process are considered as a steady-state open thermodynamic system. In this regard, the energy and exergy efficiencies, the magnitude and place of exergy losses in these process stages are estimated and discussed in detail. The energy efficiency in sorting, cleaning, crushing, preheating, screw finishing, batch tank and pasteurization units is found to be 0.981, 0.996, 0.889, 0.925, 0.312, 0.994, 0.884 and 0.474, respectively and the exergy efficiency in these units is found to be 0.997, 0.995, 0.888, 0.963, 0.233, 0.982, 0.911 and 0.209, respectively.

DEWATERING OF YOGHURT USING PERMEABLE MEMBRANE AND ACRYLIC SUPER ABSORBENT HYDROGEL

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Conventional processes of food dewatering, such as thermal, have undesirable and destruction effects on vitamins, aromatic compounds and pigments. In addition, they are accompanied with some technological complications and energy consumption. Thus, food concentration processes are directed to non-thermal techniques or methods with reduced heat effects. Superabsorbents are highly hydrophilic polymer networks which can absorb water and aqueous solutions some hundred times of their weights and retain them. These materials are subgroups of hydrogel family that are transformed into gels after absorbing water. In the present research, the possibilities of yoghurt dewatering using superabsorbents have been investigated for the first time in Iran and some remarkable results are obtained for this vital product. In the experiments carried out to investigate the effect of these absorbents on normal method of yoghurt concentration (use of permeable membrane), type of bed (wide and vertical) and time are also studied. The percentage of total soluble solids and dry solids of dewatered samples were measured in different time intervals up to 180 min. The results showed that super absorbent on a wide bed would reduce the concentration time to one third. In other words, in a certain time interval, more than 70% increase in yoghurt dry solids was observed compared to normal method. These results show that acrylic super absorbent hydrogel can be applied as highly hydrophilic material in non-thermal food dewatering methods.