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5. Quality improvement of Yogurt drink by using some modern applications

Yoghurt drink was made from cow milk (3% fat) and unsalty whey extracted from Ras cheese processing.

The milk was heated up to 85˚ C for 20 min. , cooled to 42˚ C, 2% lactic starter was added , incubation was continued for complete coagulation. To the cooled yoghurt, 15 % pasteurized unsalty whey was blended to have the yoghurt drink.

To improve the quality of the yoghurt drink 3 experiments were done .

First: Incorporation of three different stabilizers namely Pectin, Uni cream 300 and Ice star 200. Three percentage were tried 0.3, 0.4 and 0.5 % (W/V) of the yoghurt drink

Results showed the following:

1- For all treatments, as storage period advanced acidity value increased, and pH values decreased , control treatments had the highest value .

2- Addition of stabilizers led to little increase in total solid and protein and little decrease in fat.

3- No differences were detected between the three stabilizers (Pectin, Uni cream 300 and Ice star 200) concerning the soluble nitrogen .

4- Total volatile fatty acids (TVFA) were higher for yoghurt drink with stabilizers, as compared with control.

5- From organoleptic points of view 0.3 stabilizers treatments gave higher scoring points for flavour . Body and texture as compared with other ratios, special case for Uni cream 300,0.4 % concentration gave very acceptable yoghurt drink .

Second: To study the effect of some additives on the quality of yoghurt drink, Skim milk powder (SMP) 34.0 % protein, Milk protein concentrate (MPC) 69.80 % protein and Whey protein concentrate (WPC) 11.0 % protein were selected for this part of study. The three treatments were incorporated separately at a rate of 0.5, 0.1 , 1.5 and 2.0 % (W/V) to find out the best ratio improving the quality of the drink .

Results were as follows : -

1. The addition of different powders had significant effect on pH and acidity of different yoghurt drinks. WPC gave higher acidity values followed by SMP, while MPC had the lowest acidity and the highest pH values.
2. As the ratio of powder increased, also the T.S. increased, little increase was observed during the storage.
3. The addition of different powders had no significant on fat content.
4. The protein content increased for all treatments , as the ratio increased the total protein also increased. MPC samples had the highest protein content followed by SMP. The lowest were for WPC.

5. TVFA values were the lowest for control treatments 8.0 , the highest values were 12.0 for, 1.5 % and 2.0 % SMP,2.0 % MPC and 1.5 and 2.0 % WPC treatments .
6. Viscosity increased as the percentage of powder increased, MPC gave the highest viscosity. As the storage period progressed, the viscosity gradually decreased. Control samples had the highest wheying off values. The lowest was for MPC treatments followed by SMP and last for WPC.
7. The best organoleptic evaluation for all treatments were for fresh samples and accepted for 3 and 6 days old yoghurt drink and gained low scoring points for 9 and 12 days old yoghurt drinks. 1 % SMP had the best drink, while WPC and MPC 0.5 % ratio gave the best accepted yoghurt drink.

Third: It is well known that the type of starter has great effect on the texture and flavour of yoghurt drink , five types of starters were tried.

1- Traditional Zabady culture (*Streptococcus theremophillus , Lactobacillus delbrueckii ssp. bulgaricus*) .

2- Exopolysacchride producer (*Streptococcus theremophillus*)$^{+}$

3- Non- Exopolysacchride producer (*Streptococcus theremophillus*)$^{-}$

***4*- Exopolysacchride producer (*Lactobacillus delbrueckii ssp. bulgaricus*)$^{+}$.**

***5*- Non- Exopolysacchride producer (*Lactobacillus delbrueckii SSP. Bulgaricus*)$^{-}$. 2 % of each starter were separately used for the yoghurt drink production, 15 % unsalty Ras cheese whey were mixed**

with the yoghurt to make the yoghurt drink samples and were stored at 5 ± 2˚ C for 12 days .

In conclusion, the following was seen:

1. The type of strain has marked effect on the acidity and pH values, EPS^+ produce less acidity leading to better acidity falvour, control treatments had the highest acidity values followed by EPS^- starter.
2. No effect on total solids (T.S) , fat and protein content of the yoghurt remained affected by the starter . The only difference was for total volatile fatty acid (TVFA) . Like other experiments, slight increase in T.S. as a result of storage.
3. As the storage period progressed the TVFA for all treatments gradually increased .After 6 days of storage the only significant difference was between control and $Lacto^+$ treatment . By the end of storage period TVFA values were equal for control and $Strepto^-$, generally non producer Exopolysaccharide strains (EPS^-) produce more TVFA than Exopolysaccharide (EPS^+) .
4. Viscosity highly affected by the type of starter , EPS^+ had the higher viscosity values as compared with control and EPS^- . As storage period advanced the viscosity values increased for EPS^+ , while the viscosity values decreased with EPS^- and control treatments . Rate of increase in
5. viscosity was 11.7 and 14.0 % for *Streptococcus thermophillus*$^-$ and *Lactobacillus bulgaricus*$^-$.

6. The wheying off was less for EPS^+ yoghurt drink as compared with EPS^- and control yoghurt drink, so the appearance was more acceptable because it is homogeneous and samples gained higher scoring points for appearance .
7. Also total solids of all treatments were the same, EPS^+ yoghurt drink gained higher scoring points for body and texture, since exopolysaccharides produced by EPS^+ acted as a good stabilizer with good taste.
8. The organoleptic evaluation gave $streptococcus^+$ treatments the highest scoring points (44.25) followed by $lacto^+$ treatments (44.00) .