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The Dynamic of *Lactobacillus Delbrueckii Subsp. Bulgaricus* Cfu/Ml Yogurt In Validity Period

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Abstract. To obtain any therapeutic effect from consumption of yogurt, it needs to meet the criteria of a minimum of 10^6 viable probiotic cells per ml during storage until the expiry date. Yogurt samples from three different sources were obtained directly after production, and they were stored at 4°C. At five-day intervals during a storage period of 30 days, enumeration of viable probiotic cultures *Lactobacillus delbrueckii subsp. bulgaricus*, was made. Initial levels of these bacteria in most samples were higher than 10^7 CFU/ml and final levels more than 10^6 CFU/ml.

In two samples the initial level was higher than 10^6 CFU/ml and final level about 10^6 CFU/ml suggesting either a low inoculation level or that these organisms did not attain the required levels during manufacture.

Starting from the condition that a product exercises probiotic effect if probiotic microorganisms it contains, is at a level above 10^6CFU/ml, this work proposes itself to monitor the number of bacteria Lactobacillus delbrueckii subsp. Bulgaricus dynamics in yoghurt, during the validity period.

Key words: Lactobacillus delbrueckii subsp. bulgaricus, yogurt

MATERIALS AND METODS

Two yogurt samples from three different sources (T, D and P) were obtained directly after production and the samples were stored at 4°C. At five-day intervals during the storage period, enumeration of viable Lactobacillus delbrueckii subsp. bulgaricus cells was done.

One ml from each sample was 10-fold serial diluted in sterile bacteriological peptonated water. From each dilution 1 ml was allocated in two sterile Petri plates, then poured the MRS medium molten and cooled to 50 ºC. The incubation was carried out under anaerobic condition at 37°C, for 72 h. Enumeration was made using the pour plate technique. Plates containing 25 to 250 colonies were enumerated and recorded as colony forming units (CFU) per ml of the product.

RESULTS AND DISCUSSION

The viable counts of *Lactobacillus delbrueckii subsp. bulgaricus* CFU/ml yogurt, during the validity period are shown in Table 1 and Fig. 1.

Tab. 1

Viable counts of *Lactobacillus delbrueckii subsp. bulgaricus* CFU/ml yogurt during the validity period

Samples	*Lactobacillus delbrueckii subsp. bulgaricus* CFU/ml yogurt						
Determination	1 Initial	2 After 5 days	3 After 10 days	4 After 15 days	5 After 20 days	6 After 25 days	7 After 30 days
T1	$1,7x10^7$	$2,1x10^7$	$1,6x10^7$	$9,8x10^6$	$8,6x10^6$	$7,8x10^6$	$5,9x10^6$
T2	$5,6x10^7$	$4,9x10^7$	$3,5x10^7$	$2,6x10^7$	$1,3x10^7$	$9,5x10^6$	$8,4x10^6$
P1	$1,4x10^8$	$1,1x10^8$	$9,7x10^7$	$8,3x10^7$	$6,9x10^7$	$5,8x10^7$	$3,5x10^7$
P2	$7,1x10^7$	$6,3x10^7$	$4,8x10^7$	$3,1x10^7$	$1,7x10^7$	$9,3x10^6$	$8,4x10^6$
D1	$7,8x10^6$	$5,6x10^6$	$2,8x10^6$	$1,7x10^6$	$1,1x10^6$	$0,87x10^6$	$0,71x10^6$
D2	$9,3x10^6$	$8,2x10^6$	$7,5x10^7$	$5,9x10^6$	$4,2x10^6$	$3.0x10^6$	$2,2x10^6$

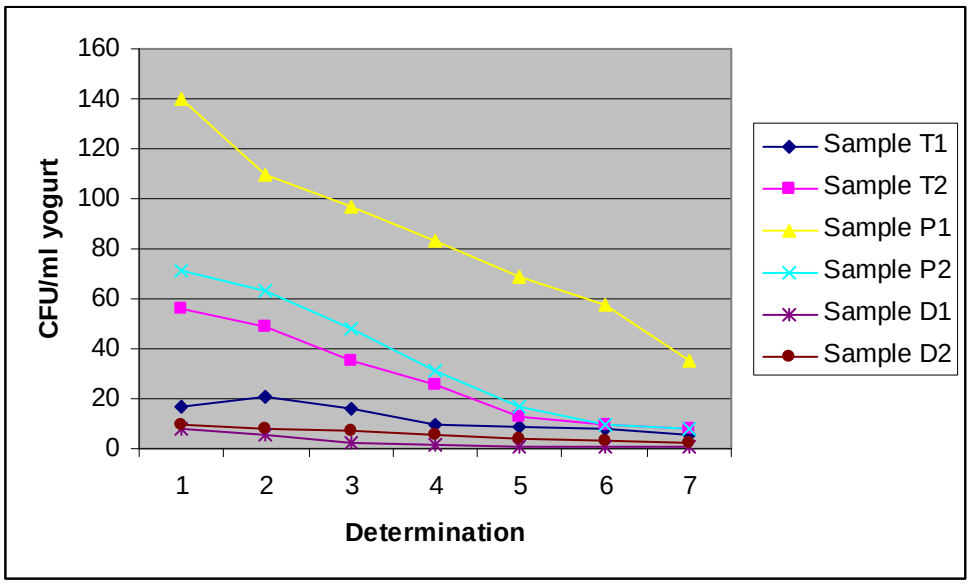

Fig. 1. Dinamic of viable counts *Lactobacillus delbrueckii subsp. bulgaricus* $x10^6$ CFU/ml yogurt

As it can be seen in Fig.1, the graphs of the dynamics above-mentioned bacteria, recorded a downward trend during the validity period of the product. Corresponding concentrations drop by about a log. In a single sample (T 1) has found a slight increase of the number (0,04 log), after 5 days of conservation and after 10 days the number has dropped steadily until the end of validity.

In case of samples from source D, the initial counts was the lowest (7, 8 i.e. 9.3 $x10^6$ UFC/ml), and after 30 days of conservation, sample D1 recorded the lowest amount of $0,71x10^6$ UFC/ml. This situation may be due either a low inoculation level or that these organisms did not attain the required levels during manufacture.

For all of the samples the population of lactobacilli has been at the end of the validity of the product over the minimum amount of 10^6 CFU/ml (proposed criterion of a 'therapeutic minimum'), which is considered as a product probiotic exercises its beneficial effects for the consumer body.

CONCLUSIONS

1. The initial level of *Lactobacillus delbrueckii subsp. bulgaricus* CFU/ml yogurt, of samples from the sources T and P was situated over 10^7 CFU/ml, while the values of those from source D, were only 9,3 respectively $7,8x10^6$CFU/ml.
2. The population of lactobacilli registered in the most samples a steadily declining for about 1 log, during storage, but it remained over the value of 10^6CFU/ml.
3. To sample 1 of yoghurt, from source D, has registered the lowest amount of 0, $71x10^6$ UFC/ml, before the expiry date of the product.

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