Effect of pH upon viability of probiotic strains in contact with fruit pulps

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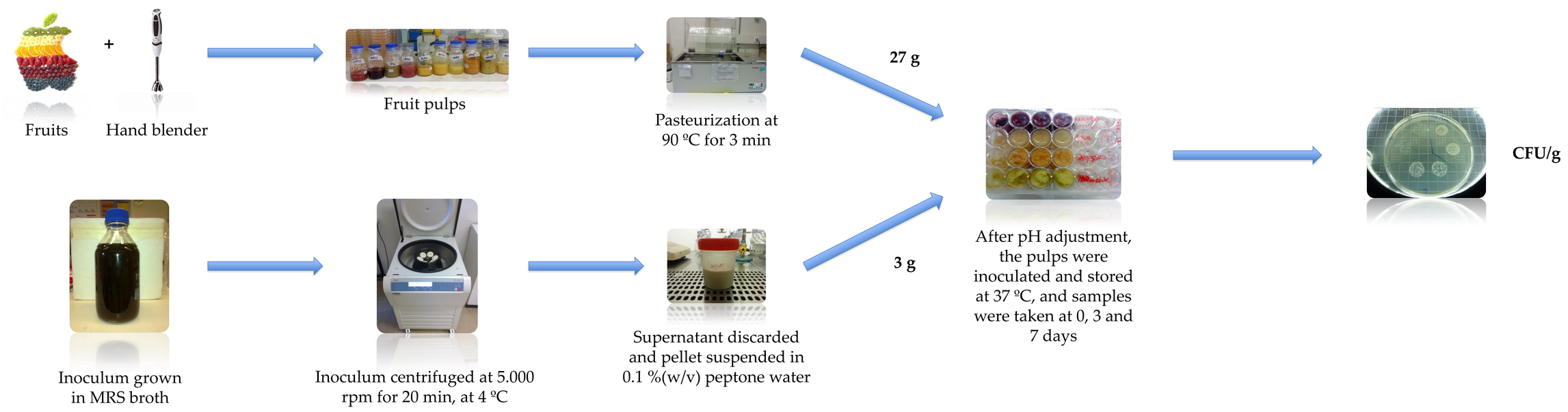
INTRODUCTION

In recent years many probiotic-containing products have been developed, the dairy and dried products being the main vehicles for probiotic intake. Fruit juices have also been studied, with less good results probably due to their low pH values, as well as to the presence of other components, adverse to the survival of the probiotic strains. In order to consubstantiate these suppositions, the effect of the fruit pulp pH upon the survival of *Lactobacillus acidophilus* LA-5 and *Bifidobacterium animalis* BB-12 was evaluated.

MATERIALS & METHODS



RESULTS & DISCUSSION

Table 1. Survival percentages of *Lactobacillus acidophilus* LA-5 in contact with avocado and lemon fruit pulps with different pH, throughout 7 days of storage at 37 ºC.

Fruit	Time (days)	pH = 2.5	pH = 4.5	pH = 6.5
Avocado	0	100%	100%	100%
	3	< 30%	88%	82%
	7	< 30%	43%	52%
Lemon	0	100%	0%	100%
	3	< 36%	0%	82%
	7	< 36%	0%	87%

Detection Limit = 5x10² colony forming units per gram.

Table 2. Survival percentages of *Bifidobacterium animalis* BB-12 in contact with avocado and lemon fruit pulps with different pH, throughout 7 days of storage at 37 ºC.

Fruit	Time (days)	pH = 2.5	pH = 4.5	pH = 6.5
Avocado	0	100%	100%	100%
	3	< 32%	62%	87%
	7	< 32%	58%	77%
Lemon	0	100%	100%	100%
	3	< 36%	< 31%	91%
	7	< 36%	< 31%	88%

Detection Limit = 5x10² colony forming units per gram.

- After one week storage, at 37 ºC, viability for both strains tested was, as expected, the highest when the pulps had a pH value of 6.5.
- At pH value of 4.5, avocado still had considerable viable cell numbers after one week contact with the pulp.
- Concerning the viability of the strains in contact with lemon pulp, no probiotics were detected after only 3 days at pH value of 4.5.
- At pH value of 2.5, no viable cells were detected in both pulps after only 3 days.

CONCLUSION

These results indicate that, although pH is important, other constituents of the fruits are also responsible for the degree of survival of probiotics in fruit matrices.

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