

**Title: Impact of a culture media supplemented with fruit by-products on the folate production by starter and probiotic cultures**

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**Abstract:**

Folate is a B-group vitamin which plays an important role in the human organism such as the biosynthesis of DNA, RNA and some amino acids. This vitamin needs to be acquired from the diet because humans are unable to synthesize it. Several countries have food fortification programs with folic acid; however, there is evidence that high consumption of this vitamin in its synthetic form may cause some adverse health effects. Thus, this study evaluated the ability of starter (*Streptococcus thermophilus* STM-6 and *S. thermophilus* TA-40) and probiotic (*S. thermophilus* TH-4 and *Bifidobacterium animalis* subsp. *lactis* BB-12) cultures in producing natural folates from fermentation of fruit residues (orange, acerola and passion fruit), since these microorganisms are commonly used by food industry. For fermentation, 4-5 log cfu/ml of cultures were inoculated in phenol red MRS broth supplemented with 1% of each residue and incubated aerobically (*S. thermophilus*) or anaerobically (*B. animalis*) at 37 °C. Samples were taken at 0 and 24 h for quantifying folate by microbiological assay using *Lactobacillus rhamnosus* NCIMB 10463 as the indicator strain. The amount of folate present in phenol red MRS broth (27±3 ng/ml) was subtracted from the values, obtaining the net values. STM-6, TA-40 and BB-12 strains were able to produce folates from the fermentation of phenol red MRS broth supplemented with passion fruit residue (29±3 to 47±8 ng/mL, 10±6 to 12±7 ng/mL and 25±9 to 55±10 ng/mL, respectively). TH-4 consumed folate available for this residue (14±1 to 6±1 ng/mL). All strains were able to produce folate from orange residue, but they consumed the folate from acerola residue. This study reinforces that the folate production by microorganisms is strain-dependent and can be influenced by culture medium. As the tested microorganisms are commonly used by the food industry, their use for the development of folate bio-enriched foods could increase the added value of products and would be a promising technological alternative for supplemented foods with synthetic folic acid.

**Key-words:** Folate, fruit residue, fermentation

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