

## Phosphoketolase activity in ruminal butyrvibrios

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Few data are available on the intracellular metabolism of pentoses in rumen bacteria. Some non-rumen bacteria and yeasts convert pentoses to acetyl phosphate via xylulose-5-phosphate through the action of phosphoketolase (EC 4.1.2.9). Radioisotope studies indicate that this metabolic pathway has physiological significance in the rumen (Wallnöfer et al, 1966, Appl Microbiol, 14, 1004-1010). Rumen microbial species with this activity remain to be identified. Phosphoketolase was absent in *Prevotella ruminicola* B14 and *Fibrobacter succinogenes* S85 (Matte et al, 1992, Can J Microbiol, 38, 370-376).

In our study, the activity of phosphoketolase and lactate dehydrogenase (LDH) were determined in *Butyrivibrio fibrisolvens* ATCC 19171 (the type strain) and in *B. fibrisolvens* strains 86, X1, X2D62 and CE51. Phosphoketolase was determined according to Matte et al (1992) and LDH using a commercial kit. *Lactobacillus plantarum* 185 was used as a positive control. All bacterial strains showed a significant LDH activity, both in glucose- and

xylose-grown cells. *B. fibrisolvens* CE51 possessed the phosphoketolase activity in xylose-grown cells : 12.1 nmol.min<sup>-1</sup>.mg<sup>-1</sup> protein. In this strain, the composition of fermentation end-products differed significantly in cultures supplied with glucose and xylose. Iodoacetate (3 mM) had no effect on liberation of acetyl phosphate from xyluloso-5-phosphate. In other butyrvibrios the phosphoketolase activity was absent and metabolic profiles were the same on both carbon sources. Activity of phosphoketolase in *L. plantarum* 185 was 33.7 and 21.9 nmol.min<sup>-1</sup>.mg<sup>-1</sup> on glucose and xylose, resp. Phosphoketolase was absent in pectinolytic *B. fibrisolvens* 787 grown on glucose and pectin.

In mixed cultures of rumen microorganisms 75 % of the xylose was converted to hexose via the route involving transketolase and transaldolase and 25 % was metabolized through the action of phosphoketolase (Wallnöfer et al, 1966). It is thus possible that more rumen microorganisms with this activity exist.