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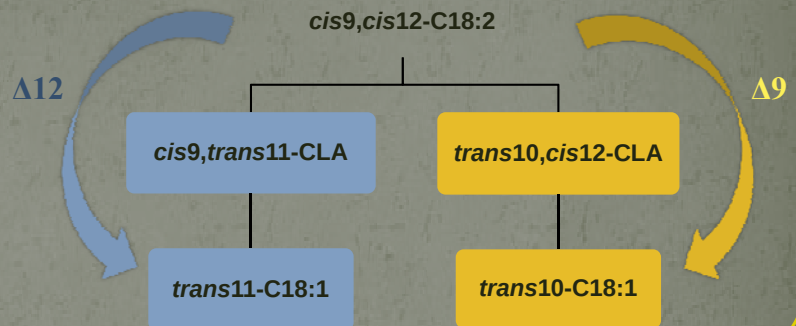
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Effects of pH and donor cow diet on ruminal linoleic acid $\Delta 12$ - and $\Delta 9$ - isomerisation

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Due to the different effects of *trans* fatty acids on human health and cows' milk production, it is necessary to better understand the reactions of ruminal isomerisation of linoleic acid (*cis*9,*cis*12-C18:2), which lead to different isomers.

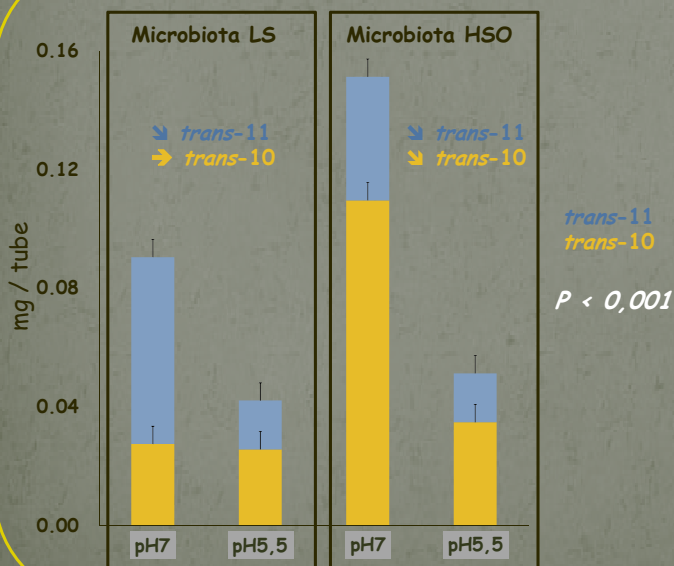
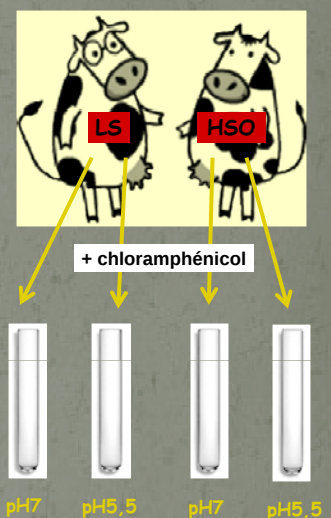


- We used 2 enzymatic solutions originating from rumen fluids collected from two cows:
 - one receiving a low-starch low-fat diet (LS, 22% starch, 3% fat, DM basis) inducing a high *trans*-11 isomers production.
 - and the other receiving a high-starch + sunflower oil (HSO) diet (33% starch, 7.3% fat, DM basis) inducing a high ruminal *trans*-10 isomers production.

- Before incubation, bacterial growth was inactivated in ruminal fluids with chloramphenicol, to avoid enzyme production during incubations.

- 1 ml of each enzymatic solution was incubated with 1 ml of a buffer solution (pH 5.5 or 7.0) in vials containing 0.5 mg of pure linoleic acid (Sigma®) for 1 hour in four replicates. Fatty acids of incubated vials were analysed by gas chromatography.

in vitro incubations



With the microbiota LS, *trans*-11 isomers production was lower at pH 5.5 than at pH 7.0.

With the microbiota HSO, the low pH resulted in both a lower *trans*-11 and *trans*-10 isomers production at pH 5.5 than at pH 7.0.

➡ Low pH inhibits the two isomerisation pathways of linoleic acid.

The capacity of ruminal fluid to produce *trans*-10 isomers probably depends on the number of bacteria and not a higher activity of enzymes.