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The ruminal level of \textit{trans}-10 fatty acids of dairy cows is linked to the composition of bacterial community

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results and conclusions

In dairy cows, \textit{trans}-10 fatty acids (t\textsubscript{10}-FA) are produced by ruminal bacteria during lipid digestion, in particular during C18:2 biohydrogenation (Fig. 1), thereafter absorbed and secreted into milk (Fig. 2).

High t\textsubscript{10} FA production causes milk fat depression and is detrimental for human consumer health.

Objective and Methods

In dairy cows, \textit{trans}-10 fatty acids (t\textsubscript{10}-FA) are produced by ruminal bacteria during lipid digestion, in particular during C18:2 biohydrogenation (Fig. 1), thereafter absorbed and secreted into milk (Fig. 2).

High t\textsubscript{10} FA production causes milk fat depression and is detrimental for human consumer health.

Results and conclusions

A negative correlation (R=-0.7) was noticed between t\textsubscript{10} FA and milk fat content (MFC) which was, on the contrary, positively but poorly correlated (R=0.2) to t\textsubscript{11} FA.

A relationship between lactic acid production and high levels of t\textsubscript{10} FA has already been observed.

In this study, an increase in Veillonellaceae family and Lactobacillus genus, which are consumers and producers of lactic acid respectively, is noticed in ruminal fluids exhibiting high t\textsubscript{10} FA percentage.

The abundance of other bacteria were also linked to t\textsubscript{10} FA production but their functions are not yet well-established.

<table>
<thead>
<tr>
<th>Phylum</th>
<th>Order</th>
<th>Family</th>
<th>Genus</th>
<th>R(\textsubscript{0.7})</th>
<th>P-value</th>
<th>Abundance (%)</th>
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<tbody>
<tr>
<td>Firmicutes</td>
<td>Clostridiales</td>
<td>Lachnospiraceae</td>
<td>Syntrophococcus</td>
<td>0.8</td>
<td>***</td>
<td>18.05</td>
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<td>Lachnospiraceae</td>
<td>Butyrivibrio-Pseudobutyrivibrio</td>
<td>0.9</td>
<td>***</td>
<td>0.87</td>
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<tr>
<td>Firmicutes</td>
<td>Clostridiales</td>
<td>Lachnospiraceae</td>
<td>Dialister</td>
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<td>**</td>
<td>0.18</td>
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<tr>
<td>Firmicutes</td>
<td>Lactobacillales</td>
<td>Veillonellaceae</td>
<td>Lactobacillus</td>
<td>0.7</td>
<td>**</td>
<td>0.97</td>
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<tr>
<td>Bacteroidetes</td>
<td>Bacteroidales</td>
<td>Prevotellaceae</td>
<td>uncultured</td>
<td>-0.7</td>
<td>*</td>
<td>1.91</td>
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<td>Bacteroidales</td>
<td>RF16</td>
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<td>-0.7</td>
<td>**</td>
<td>0.70</td>
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<tr>
<td>Actinobacteria</td>
<td>Coriobacterales</td>
<td>Coriobacteriaceae</td>
<td></td>
<td>0.9</td>
<td>***</td>
<td>0.80</td>
</tr>
</tbody>
</table>

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