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Breeding for more methane efficient beef on dairy slaughter calves

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Within the last ten years the use of beef semen in dairy herds have increased from a very low level up to approximately 250.000 doses per year. This became possible through an increased use of sexed semen, meaning that a lower frequency of the dairy females is going to give birth to purebred dairy calves - bull calves for slaughtering and heifer calves for replacement. The remaining females – primarily older cows - can then be inseminated with beef semen resulting in crossbred offspring with higher daily meat gain and EUROP classification. The beef semen used are primarily from beef bulls selected for use within the suckler cow production. Furthermore, these beef sires are not selected for traits that reduce the carbon footprint of their offspring.

There is therefore room for improving both 1) the collection of phenotypes measuring efficiency and carbon footprint and 2) the breeding goal for the beef bulls destined for use on dairy females. This will allow us to implement efficient breeding schemes with the aim to produce beef bulls to be used for insemination in dairy herds. With the current focus on reducing the carbon footprint of the dairy and beef industry, feed efficiency and methane emission must be an important part of the breeding goal. There were however no registrations for these traits on beef × dairy calves. To overcome this, the FutureBeefCross project was initiated. Within this project phenotypes for feed efficiency, methane emission and meat quality on more than 10.000 beef × dairy calves will be available.

Regarding methane emission the very first results indicate that the level of methane emission per kg of produced meat are lower when produced on beef × dairy calves compared to Holstein bull calves (Johansen et al., 2022, WCGALP). This means that the dairy cattle sector, with increased use of beef semen, will be able to produce more meat from slaughter calves, with less methane emission per kg of produced meat. The results also show that the heritability for methane concentration traits is around 0.40 for the beef × dairy calves that are sired by a Danish Blue bull. This gives plenty of room for selective breeding for reduced methane emission from beef × dairy calves.

To conclude:

1) The heavily increased use of beef semen in dairy herds have reduced the methane emission within the slaughter calf production.
2) The heritability for methane traits within beef × dairy calves looks promising for including these traits in the breeding goal for beef bulls destined for use on dairy females resulting in a further reduction of the methane load from beef × dairy calves.