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Milk does a body good: Calves too?

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Previous studies have shown that there is a quantitative trait locus (QTL) on bovine chromosome six (BTA6) in Holstein cattle that affects the protein concentration of milk. This effect is not only economically important to dairy breeds, but may also have a significant affect in beef breeds by influencing the weaning weight of calves. A higher weaning weight in calves is preferred because it is a good indicator of the mature or "finished" weight of the animal. In the developed world, dairy and beef cattle breeds have only been reproductively separated for about 500 years and the causal mutation appears to predate this divergence. Therefore, we believe that the causal mutation should be segregating in beef as well as dairy breeds. We shall examine the effect that this QTL has on the preweaning growth of Angus cattle by genotyping more than 1000 Angus AI sires for single nucleotide polymorphisms within the positional candidate genes Osteopontin (OPN) and ATP-binding cassette, subfamily G, member 2 (ABCG2) and comparing their effects on Expected Progeny Differences (EPD) for the maternal effect on weaning weight. OPN is a secreted glycoprotein that is expressed in numerous mammalian tissues and plays an important role in multiple biological functions. ABCG2 secretes clinically and toxicologically important substrates into milk. However, neither of these genes has yet to be confirmed as being causal for the QTL influencing the protein concentration of milk. If we can demonstrate that one of these polymorphisms is the causal mutation via an effect in beef cattle, breeders could use the resulting genetic test to selectively breed cattle that would produce calves with enhanced weaning weights