

Remarkable adaptations in the metabolism of heat stressed cows I: fat metabolism

The decreased feed intake of heat stressed cows is a useful adaptation from the cow's perspective. A reduced feed intake means less heat production from rumen fermentation, and thus less heat for the cow to get rid of.

However, it can take some time before milk production decreases in reaction to the decrease in feed intake; driving the cow into a negative energy balance. Under 'normal' negative energy balance circumstances body fat reserves are mobilised, what we associate with ketosis.

However heat stressed cows restrict body fat mobilisation, which is reflected by a reduced milkfat content. Actually, the body fat's capacity for fat storage seems to be greater during heat stress. A possible explanation for this phenomenon might be that the use of fat as an energy source yields more heat than glucose. Not using fat as an energy source thus seems a good adaptation for the heat stressed cow.

A consequence is that feeding fats as an energy source is less effective during heat stress; digested fats are for a large part stored in body fat reserves, but not liberated again to be used as energy source. However, feeding fats to heat stressed cows is effective to elevate milk fat contents, as the udder is capable of utilising the digested fats directly.



