Dry cows and heat stress

Dry cows have received little attention when it comes to managing heat stress. Autumn and year-round calving farms that dry cows off over the hot months should be doing more to ensure their dry cows stay cool. Heat stress during pregnancy can have consequences on calf health and cause far-reaching health problems later in life.

A growing body of evidence demonstrates that dry herds in heat stress have reduced milk yields during their next lactation, reduced calf weight and a greater risk of health problems.

Reduced milk in next lactation

Dry cows generate less metabolic heat than lactating cows and have a higher upper critical temperature. This may contribute to the belief around heat stress being a lesser concern. However, studies consistently show that when cows experience heat stress during late pregnancy they produce less milk in the next lactation. (See Figure 1).

Researchers believe milk yield reduction is due to impaired blood flow through the dry cow's udder over the last two months of pregnancy. The udder is rapidly growing over this period in preparation for the next lactation. The impaired blood flow stunts udder growth, which means they possess fewer functioning mammary cells with reduced secretory capacity. As a result, they will produce less milk and become disadvantaged while calving.

Smaller, lighter calves

Studies in many species of animals show the conditions that offspring are subjected to while still in the uterus affect their lifetime health and performance. When the foetal calf's body temperature is increased, as it is when its mother experiences heat stress during late pregnancy, it appears that this negatively affects the calf's metabolism and gene expression, pre-programming it for sub-optimal health and performance.

When cows suffer heat stress during their dry period, they have smaller placentas with reduced blood flow through the uterus and umbilical cord. The calves tend to be born several days earlier and a few kilograms lighter than calves of cows that kept cool during their dry period.

When cows experience heat stress during late pregnancy it suppresses their immune system for many weeks. Studies have shown the neutrophils of heat stressed cows become less aggressive against bacteria. Neutrophils are the white blood cells acting as the first line of defence against pathogens.

Cows that experience heat stress during late pregnancy may therefore be at greater risk of health problems such as mastitis and retained foetal membranes around calving when their immune function is already naturally suppressed.

Calves less productive and fertile

Calves born to cows heat stressed during the dry period go on to be less healthy, less fertile and less productive in their first lactation. Affected calves have been shown to be less able to absorb maternal antibodies from the first colostrum consumed soon after birth. This results in lower blood maternal antibody levels than in calves from dry cows that don't experience heat stress.

These calves' cell-mediated immune function may also be compromised. This results in them being more susceptible to infections that commonly occur preweaning. The ultimate outcome is poor growth rates, higher levels of illness and higher mortality rates.

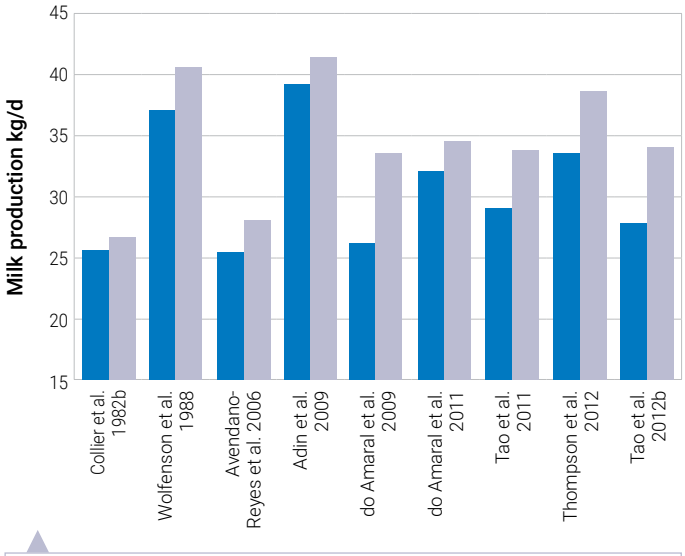


Figure 1 *Effect of heat stress and cooling during the dry period on milk production in the following lactation. Source: Tao and Dahl, 2013*

Researchers have recently found that calves whose dams are heat stressed during pregnancy go on to become maiden heifers that are less fertile. This means a heifer is produced that has both lower production and more difficulty getting in calf.

In the short term, to protect dry cows from heat stress:

- If existing natural shade on the home farm or support block can't provide four square metres of shade per cow at midday, then find alternative paddocks
- Portable paddock shade structures or a permanent shade structure are also options. In the longer term, the farm plan should be reviewed to:
- Establish more tree belts along dry cow paddocks and springer paddocks
- Adjust the farm's calving system to reduce the number of cows dried off over the hot months of the year.

Cool Cows

If you missed Subtropical Dairy's Cool Cows webinar on Monday, 12th October with Dr Neil Moss (Scibus), the recording is available to view here. Preparing for the hot, humid summer conditions early can help reduce the impacts on cow comfort, milk production, fertility and longer-term herd performance. From shade and cooling, and nutrition and genetics, there are a host of practical options that you can start putting in place to minimise the effect of hot conditions on your herd.

There are also Heat Stress and Hot Conditions resources available on the Dairy Australia webpage here.