



LESS STRESS, MORE FERTILITY

Heat stress from the cow perspective!

Do you realize that heat tolerance of cows is much lower than in humans? It happens because the mechanisms of thermoregulation are different in cows, they are less efficient.

So whenever you are starting to feel heat be aware that your cows may have been feeling that for a very long time. That depends on temperature and humidity and here you find a nice table that helps to understand how sensitive your cows can be!

Temperature °C	Relative Humidity %										
	0	10	20	30	40	50	60	70	80	90	100
18	61	61	61	62	62	63	63	63	64	64	64
19	62	62	62	63	63	64	64	65	65	66	66
20	63	63	63	64	65	65	66	66	67	67	68
21	63	64	64	65	66	67	67	68	69	69	70
22	64	65	65	66	67	68	69	69	70	71	72
23	65	66	66	67	68	69	70	71	72	73	73
24	66	67	67	69	70	70	71	72	73	74	75
25	67	68	68	70	71	72	73	74	75	76	77
26	67	69	69	71	72	73	74	75	77	78	79
27	68	69	69	72	73	74	76	77	78	79	81
28	69	70	70	73	74	76	77	78	80	81	82
29	70	71	71	74	76	77	78	80	81	83	84
30	71	72	72	75	77	78	80	81	83	84	86
31	71	73	73	76	78	80	81	83	85	86	88
32	72	74	74	77	79	81	83	84	86	88	90
33	73	75	75	79	80	82	84	86	88	90	91
34	74	76	76	80	82	84	85	87	89	91	93
35	75	77	79	81	83	85	87	88	91	93	95

Temperature Humidity Index (THI) for Dairy Cows:

It includes both temperature and humidity to determine the point at which heat stress may occur.

For cattle, 72 is the threshold number indicating heat stress!

Now, take the year average temperature and humidity on your farm and ask yourself the question based on the INDEX and not on your tolerance: **is there any chance that your cows might have any heat stress?**

- No heat stress
- Risk zone
- Heat stress
- Advanced heat stress
- Severe heat stress

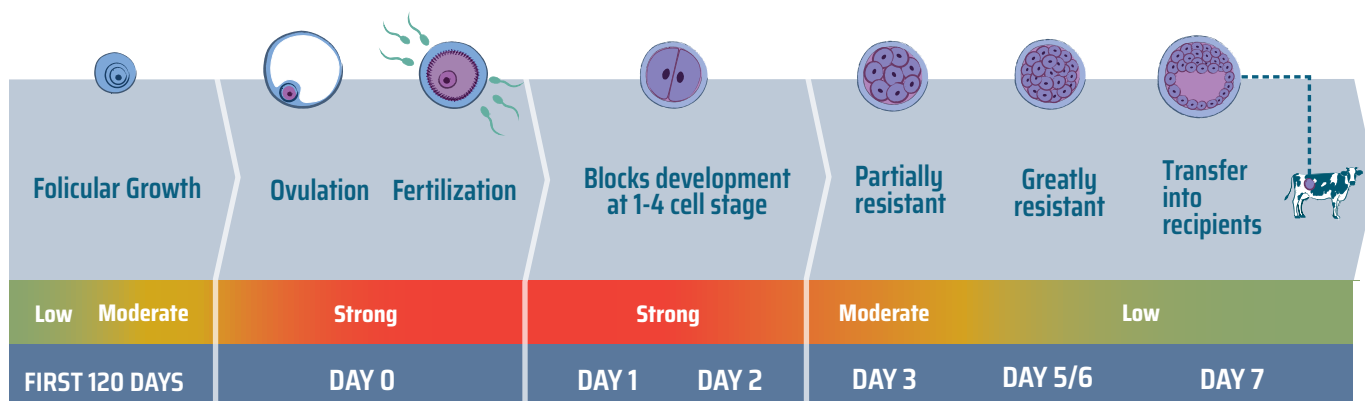
Bonmanova J. et al (2007)



COW'S FERTILITY AND WARM WEATHER

Summer: the enemy of high-producing dairy cows

- High-producing cows normally create a lot of body heat.
- In hot weather they can't dissipate that heat efficiently so their body temperature rises causing **HEAT STRESS**.
- **HEAT STRESS** may have devastating effects on fertility, reducing conception rates by 50% or more:
 - Damage to the oocyte (before ovulation)
 - Death of the embryo (until 3 days after fertilization)
 - Reduced estrous behavior



LEVEL OF HEAT STRESS IMPACT: Low Moderate Strong

Modified from Hansen 2013



There is no “silver bullet” for **HEAT STRESS**

- Cooling strategies like shade, fans and sprinklers are great, but even with extensive cooling, fertility can still be compromised.
- FTAI (Fixed Timed Artificial Insemination) can help with silent heats but not with embryonic death.
- “Not breeding in summer” is often not an option.

2 DON'T STRESS

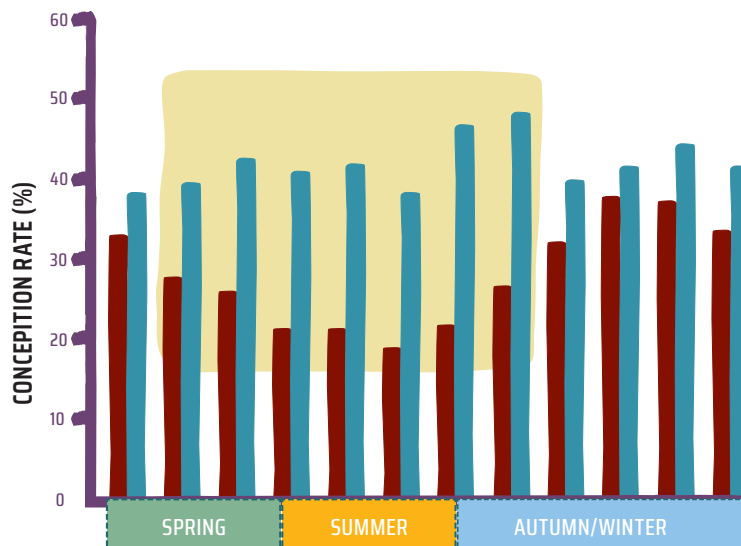


Embryo Transfer can help you

- Embryo transfer (ET) is an effective tool to increase fertility during **HEAT STRESS**.
- Embryos are typically transferred at day 7 after estrus, bypassing the risk of poor egg quality and early embryo death.
- Timed Embryo Transfer (TET) can also be used to bypass effects on estrus detection.
- In the summer, pregnancy rates to embryo transfer (ET) can be twice as high as those for artificial insemination (AI).
- The difference in pregnancy rates between summer and winter is much less for ET than for AI.

Just filling the gap

- ET has been used for over 40 years to accelerate genetic development in cattle. Studies have also demonstrated that using ET can bring improvements for pregnancy results in dairy cattle that are suffering from **HEAT STRESS**.
- Transferring embryos of good quality typically results in 45% to 55% pregnancy rate when transferred to normal, cycling cows. These rates show little variation between hot and cool months.



Conception rate differences in cows when comparing artificial insemination and embryo transfer, during hot and cool months.

■ AI ■ ET ■ the gap

Modified from Baruselli 2011



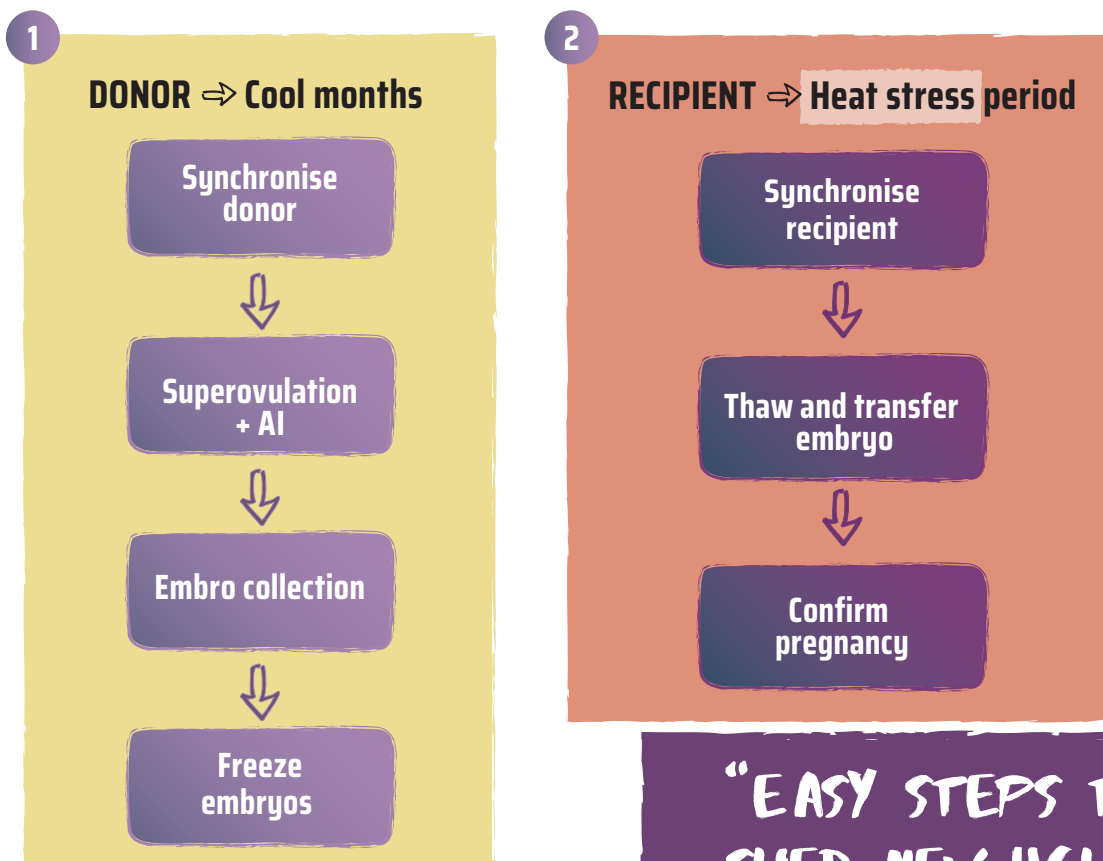
WHEN TO DO EMBRYO TRANSFER?

Conceived to support you for an effective management

First evaluate the impact of **HEAT STRESS** on your herd

- Compare AI rates during hot months vs cool months in past years
- Measure body temperature during the hottest time of the day **or use the INDEX THI as reference of hot periods.**

Methodology to do Embryo Transfer to overcome Heat Stress:



“EASY STEPS TO SHED NEW LIGHT ON AN OLD PROBLEM”

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