

# HEAT DETECTION

## Level 3

Topic	Training & information Content
5.1	Dairy Cattle Breeds and Breeding
5.2	Breeding program for a dairy farm (medium & large)
5.3	Conformation, Type classification and judging
5.4	Cow handling
5.5	Milk production recording
5.6	Heat Detection
5.7	Artificial Insemination
5.8	Pregnancy Diagnosis
5.9	Fertility Management
5.10	Cows with abnormal discharge
5.11	Fertility disease recording
5.12	Calving recording
5.13	Use of Key Performance Indicators



# Heat detection (Level 3)

## You will learn about (learning objectives):

- How to recognize all the important heat signs of a dairy cow
- Farm herd fertility, including Cow fertility card
- Estrus (heat) cycle in cattle

# Heat detection (Level 3)

## Heat (Estrus) in cattle

### Background

- Heat (estrus) is the period of sexual excitement when the cow/heifer is receptive to a male
- To know the importance of effective heat detection and achieve overall optimal herd fertility, farmers have to first appreciate that a cow only produces milk when she has conceived and given birth.



# Heat detection (Level 3)

## Farm herd fertility

- To successfully detect heat and maintain optimal herd fertility, there are a number of factors to have in mind.

### Good to know

1. Heat detection is a time-consuming activity
2. Many farmers underestimate the importance of heat detection
3. There is a long list of reasons why cows don't show any heat signs
4. Bio-security plays a key role in a farm's herd fertility
5. The calving process and the calving environment are two major building stones of good fertility results
6. A farm's financial results are heavily dependent on fertility issues



**Source:**

[https://stmaaprodfwsite.blob.core.windows.net/assets/sites/1/2017/08/100817-two-dairy-cows-bulling-c-John-Eveson-FLPA-imageBROKER-REX-Shutterstock-rexfeatures\\_4755632a.jpg](https://stmaaprodfwsite.blob.core.windows.net/assets/sites/1/2017/08/100817-two-dairy-cows-bulling-c-John-Eveson-FLPA-imageBROKER-REX-Shutterstock-rexfeatures_4755632a.jpg)

# Heat detection (Level 3)

*Heat detection is a time-consuming activity*

What does this mean?

- It points out that heat detection is heavily underestimated; thus more time should be spent observing cows for heat signs. Successful heat detection heavily relies on number observations per day, time of day and duration of the observations.

OBSERVATIONS PER DAY.	POINT OF TIME					30 min	20 min	10 min
2	06.00	20.00				62,9	37,1	14,3
2	06.00	22.00				48,6	31,4	8,6
2	10.00	20.00				74,3	48,6	25,7
2	10.00	22.00				62,9	42,9	22,9
3	06.00	12.00	22.00			62,9	48,6	17,1
3	10.00	12.00	20.00			77,1	54,3	22,9
4	06.00	12.00	16.00	22.00		74,3	57,1	31,4
4	06.00	10.00	16.00	20,00		82,9	57,1	34,3
5	06.00	10.00	14.00	18.00	22.00	85,7	62,9	37,1

- < 50 % = TO LOW;
- >50 - <60 % = ACCEPTABLE;
- > 60 % = GOOD.



From this table, the highest success rate of heat detected (85.7%) has been achieved when the highest/most number of observations were made (5), at specific times (*early morning, mid morning, afternoon, late afternoon and late evening*) and for the longest duration (30 minutes)



# Heat detection (Level 3)

## Farm Herd Fertility

- Cows need to be well fed and healthy to be productive and have good reproductive performance (sound fertility) in the herd.



***Note:** Not every cow becomes pregnant after insemination and not every cow comes in heat every three weeks. In case of abortion and/or Early Embryonic Deaths (EED), heats will be irregular. Hence more time spent observing cows is an investment.*

# Heat detection (Level 3)





*Tip/Good to Know: Smooth calving process and calving environment have a lot of influence on future fertility*

- Healthy cows come in heat 20-40 days after calving. Farmers need to be trained on heat detection, keep good administration of heat and fertility records to be able to estimate when a cow might come in heat again (even after calving). This can be made possible by use of a Cow Fertility Chart.



# Heat detection (Level 3)

FERTILITY CHART; 202 / 202

Calving date	Calving details	Calf sex+ nnumber	Milkfever	Retained-placenta	Reproductive Disorder. 1, Endometritis 2, Cystic Ovaries 3, Others.	1st Heat	2nd Heat	Bull name	AI technician	1st Service date	2nd Service date	3th Service date	4th Service date	5th Service date	6th Service date	PD Date +/-	Exp Calv date	Dry off date	Remarks		

### Cow Fertility Chart

- A cattle Fertility Chart is something that each farm should have
- It helps keep records/data that helps a farmer make informed or right decisions at the right moment

**Note:** A cattle's fertility history/records might be in your mind, but its better to put it on paper – for future reference.



# Heat detection (Level 3)

- Furthermore, good administration of heat and fertility records will help the farmer estimate the time when a cow is expected to come in heat again and to decide when to inseminate here again

*For instance:*

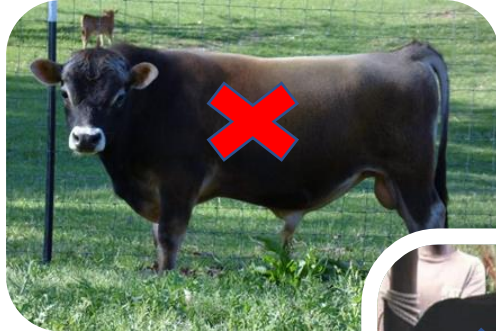
- A farmer can take note of important dates like the Calving Date e.g. March 11 for a given cow



# Heat detection (Level 3)

- It is recommended not to serve the cow either by bull or AI in the first 60 days after calving even if heat is detected. i.e.

March 11- May 10= 60 days



JANUARY						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

FEBRUARY						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

MARCH						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

APRIL						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

MAY						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

JUNE						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

JULY						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

AUGUST						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

SEPTEMBER						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

OCTOBER						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

NOVEMBER						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

DECEMBER						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				



# Heat detection (Level 3)

## *Maintaining cow/herd fertility*

- Normally after calving, there are two questions to keep asking yourself as you aim to have reproductively sound cows/herd (cow fertility):

1. Will the cow come in heat again?

**Possible answers:** *May be Yes or May be Not*



**YES!**



**NO!**



2. If yes, When will the cow come on heat?

These questions are best answered by deeper knowledge or understanding of cows' estrus (heat) cycle.



# Heat detection (Level 3)

## Understanding of the cyclus of the cow (estrus/heat cycle)

Cows may exhibit:

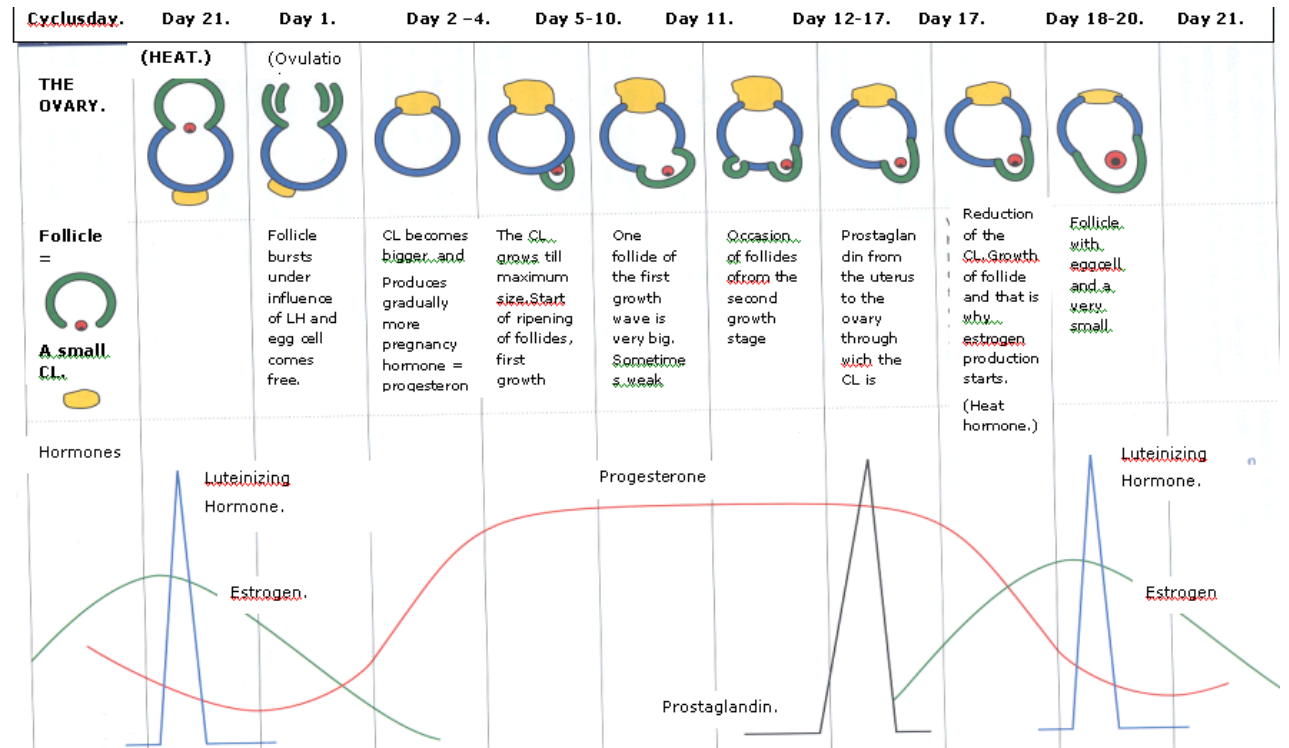
- Missed/silent Heat
  - Poor observation
  - Nutritional (energy) causes
  - Poor hormonal activity
- False Heat
  - Positive Energy Balance
  - Behaves like being in heat
  - Cannot become pregnant





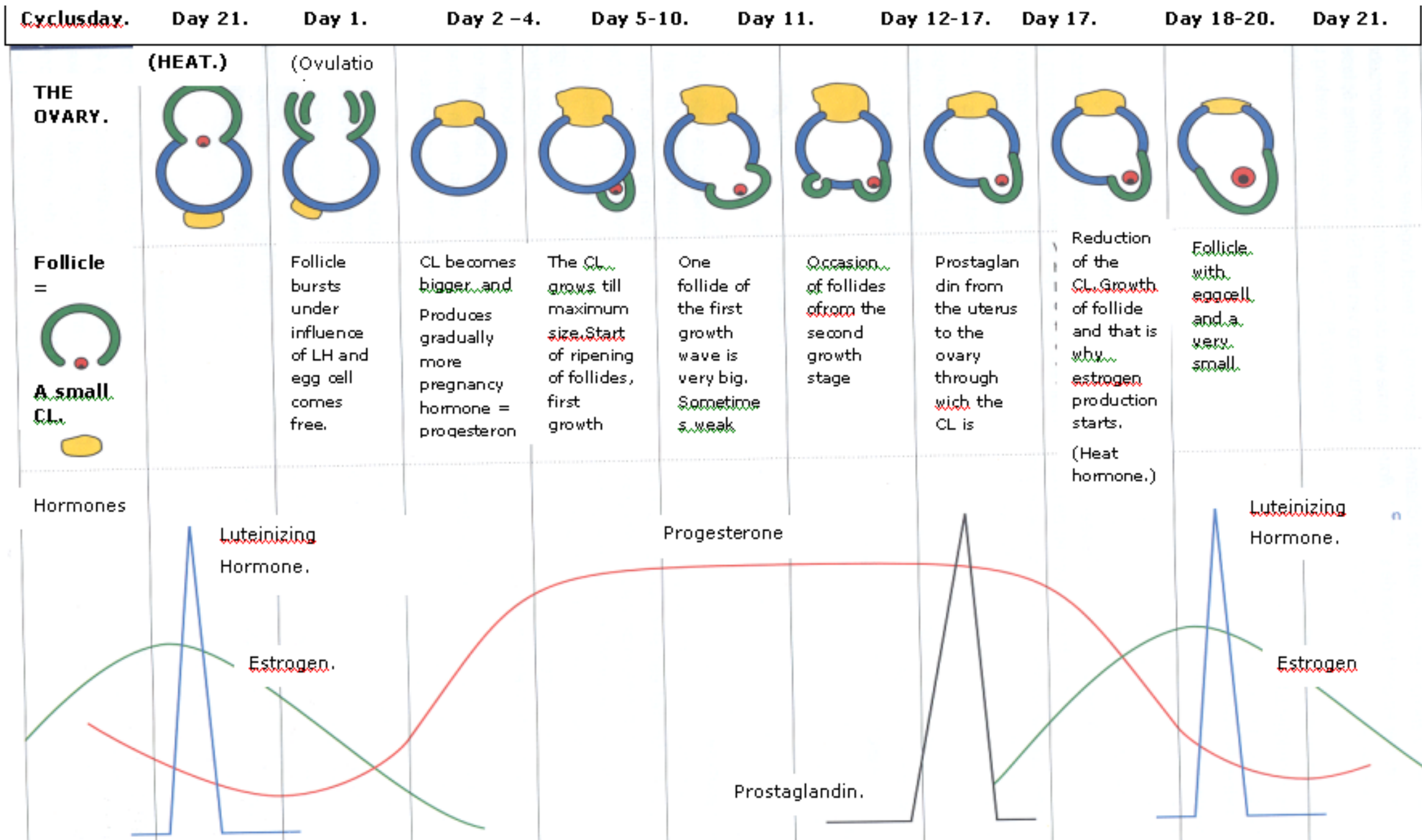
# Heat detection (Level 3)

- Continuous Heat
  - Hormonal unbalance
  - Treatment is needed
  - Low chance of becoming pregnant
- Long Heat
  - No ovulations
  - Energy shortage
- Heat during pregnancy
  - Same as false heat
  - Extra pregnancy test is recommended



Take note that all these heats still point down to understanding cows estrus cycle.

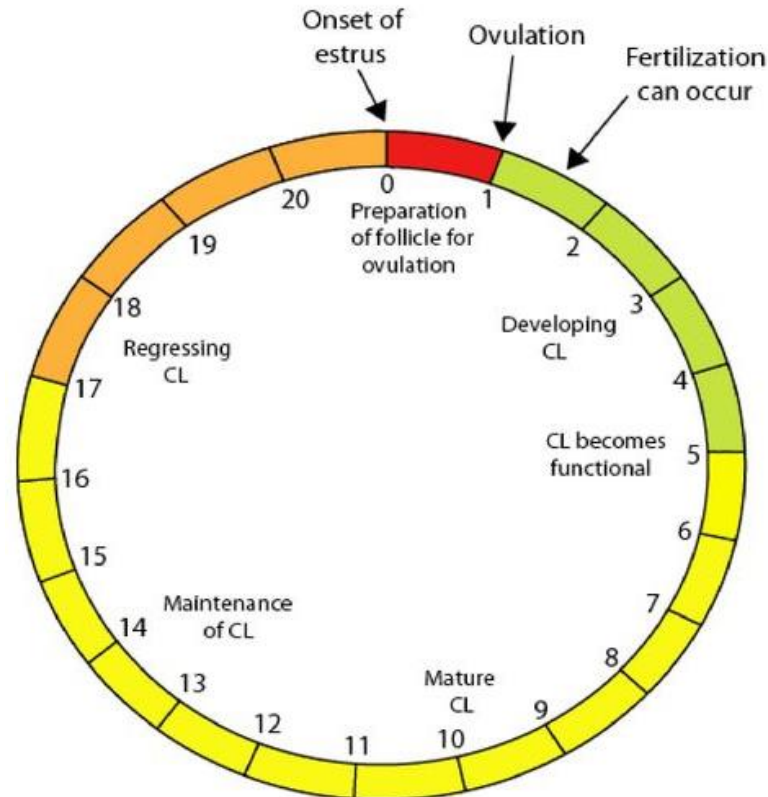
# Heat detection (Level 3)



# Heat detection (Level 3)

*The chart explained:*

- Cows' estrus cycle is measured from the onset of estrus (heat) to the beginning of the next, usually 21 days. The 21-day interval between the heats is dictated by the lifespan of the corpus luteum (CL)
- On Day 1, the ovulatory follicle ruptures or 'ovulates' and releases the egg to be fertilized (ovum) into the oviduct



- On days 2 to 4, changes occur in the cells that line the ovulated follicle. These cells are transformed into a corpus luteum (CL). The CL primarily produces Progesterone hormone (to support pregnancy) i.e. If the egg released on Day 1 is fertilized, the CL will be maintained throughout the pregnancy to keep secreting progesterone hormone - she may not come on heat again.

# Heat detection (Level 3)



*Source: <https://stmaaprodfwsite.blob.core.windows.net/assets/sites/1/130817-Bulling-cow-c-no-credit.jpg>*

- If the cow is not pregnant, the CL will be maintained on the ovary until approximately Day 17. The uterus then secretes the Prostaglandin hormone. Prostaglandin destroys the CL, causing it to regress and stop producing Progesterone. This allows formation of a new ovulatory follicle (with an egg cell), which secretes and increase Estrogen hormone (heat hormone) to give another opportunity for the cow to show heat signs again.

**Note:** Not every cow becomes pregnant after insemination and not every cow comes on heat every three weeks. In case of abortion and or early embryonic death, heats will be irregular.



# Heat detection (Level 3)

## Signs of Heat

- Let's have a little task:

Take a moment and prepare a list with 10 heat signs you know. Try to give a score for each heat sign you have listed, the scores should be between 0 and 100 indicating the reliability/importance.

Let's see whether your scores (participant's/trainee score) for each heat sign is the same as the agreed score.

	Sign of heat	Learner's Score	Agreed Score
<b>Standing heat</b>			
1.			
<b>General Pre-heat</b>			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
<b>Post-heat</b>			
9.			
10.			

# Heat detection (Level 3)

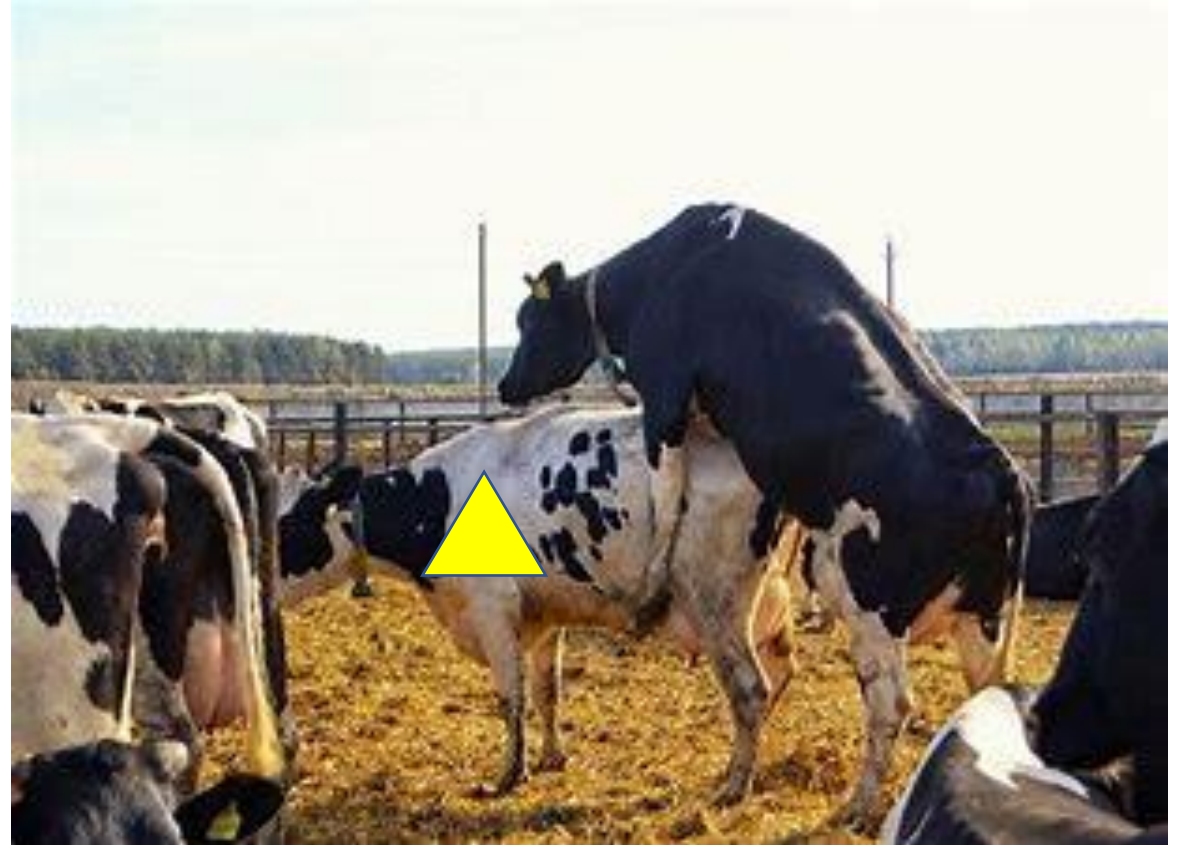
## Standing Heat (Primary heat sign)

- This is when the cow stands still while being mounted by other cows (100 points!! – the perfect time to bring her for bull service or immediately call the AI technician case of AI)
- Not every cow shows standing heat events, and if they show, it is mostly in the evening and night hours. Since you may not see her on standing heat, it is important to be aware of all the other (pre) heat signs.



# Heat detection (Level 3)

- In modern dairy breeds, standing heat will last only a few hours (2-8 hours) with very few standing events (8-10 times). Every standing event will last maybe 8-10 seconds; translating to a maximum of  $10 \times 10 = 100$  seconds every three weeks to notice a cow in standing heat.



10	20	30	40	50	60	70	80	90	100
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# Heat detection (Level 3)

## Other Heat signs

### Pre-signs of upcoming heat (Before Heat)

- Chin Resting is a 20% heat sign

When cows/heifers show this, then close observation is needed. Very soon some more signs may show up. In case of chin resting, there's almost 90% certainty the cattle will show real heat.

**Note:** Chin resting is very innocent but very important "pre" heat signal



Yellow triangle denotes cattle to give attention



# Heat detection (Level 3)

- Sniffing/Licking

This is a typical bull behavior shown by cows/heifers who are close to heat. It is a 30% heat sign. Also note that the “victim” cow is suspected to be close to heat.

**Note:** Sniffing/licking is mostly shown or seen when majority of herd is resting



# Heat detection (Level 3)



Clear,  
stringy  
discharge

- Clear, stringy discharge

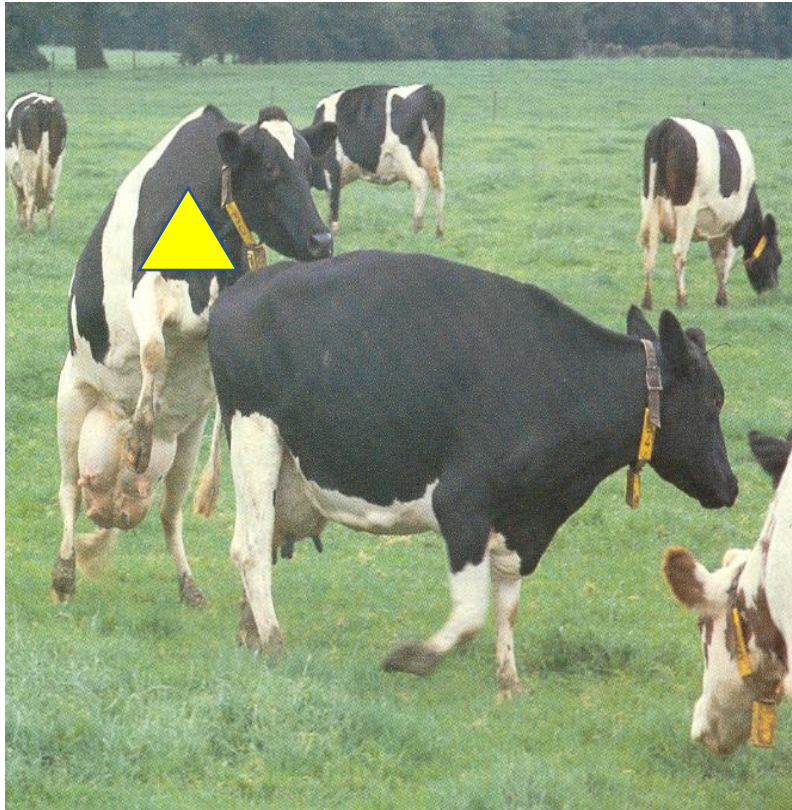
The clear discharge is a sign that the cow's uterus is in good condition and in principle ready for the next pregnancy.

In case of visible discharge, this is 30 points on a scale from 0-100. At this point we would love to see some more signs before insemination can take place.

**Note:** *It is very important that the discharge is clear and clean*



# Heat detection (Level 3)



- Mounting or attempt to mount other cows

This is 40% heat sign that cows/heifers want attract other cows. Usually, it is a matter of time the cow will be mounted by other cows and turn into standing heat

Also the “victim” needs to be observed closely the coming hours as they could possibly exhibit/be in heat.

Mounting is too early for mating incase you are to use a bull.

**Note:** This sign warns that it is going to be serious. i.e. the cattle will show heat sign that can't be missed.

10	20	30	40	50	60	70	80	90	100
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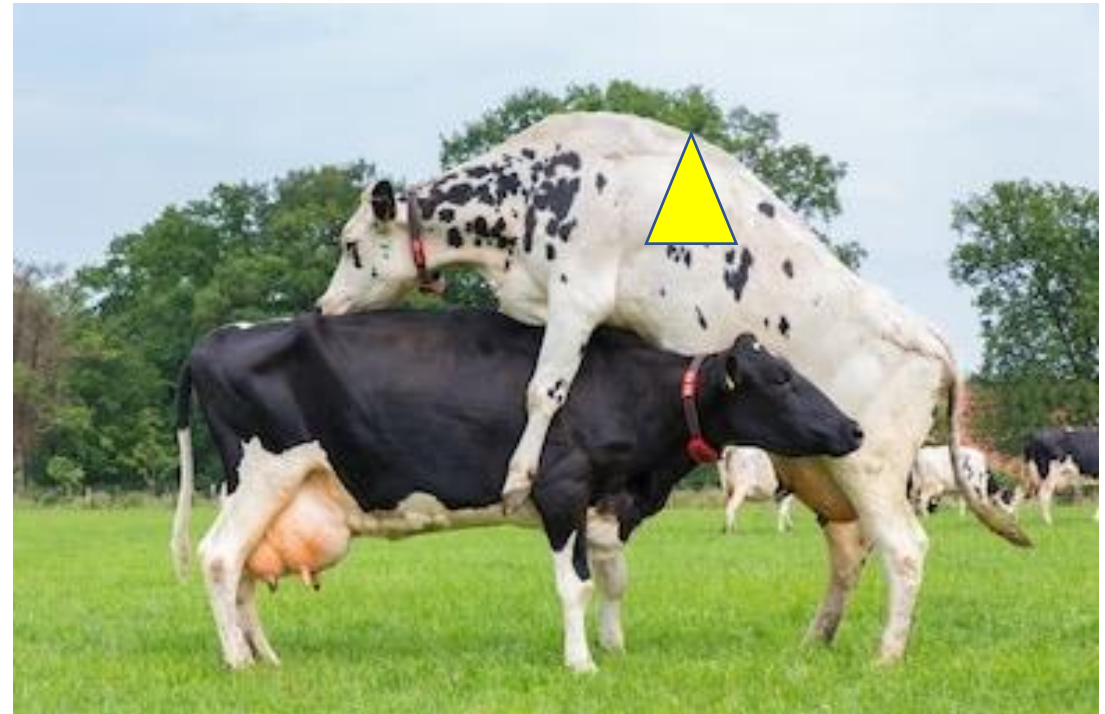
# Heat detection (Level 3)

- Mounting other cows on head side

Besides standing heat, this another most reliable heat sign. The cow who is mounting for sure is in heat and must have shown some other signs already (earlier).

Cows with this behavior usually are the low ranked cows who don't get enough attention from other herd mates

**Note:** Mounting other cows on head side is a no doubt sign. The cow is not able to hide the upcoming heat anymore.





# Heat detection (Level 3)

## Other Heat signs

- Apart from Standing Heat event (primary heat sign), there is a long list of other (important) heat signs
- Looking at the list of (pre) heat signs, it is important to know that every sign will help you to detect a cow on heat
- Not every sign is shown by every cow, be prepared that there are cows that only will show you the standing heat event and nothing else/no other heat sign.

## Heat signs that are important to recognize;

Restlessness	5 %.
Drop in milk production	5%
Swollen vulva	5 %
Phleming	10%
Bellowing	10%
Mounted but not standing.	10 %.
Fresh saliva on cow's back	15%.
Chin resting.	20 %.
Back bending (touching clitoris)	30%
Continuous Clear Discharge (Few Days)	30 %
Sniffing several other cow's vagina	30 %.
Mounting farmer (when standing in front of cow)	30%
Mounting or attempt other cows.	40 %
Mounting head side other cows.	60 %
Standing Heat.	100 %.

**Note:** *If a cow scores more than 50% in a period of 24 hours, you can be almost sure that she is on heat.*

# Heat detection (Level 3)

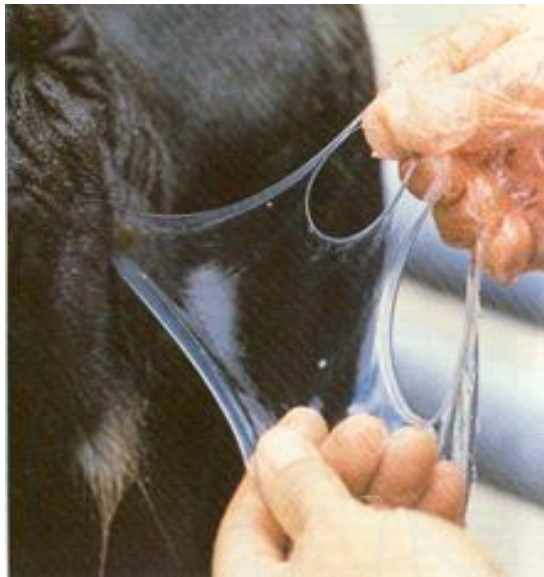
## Decision making (when to inseminate)

- All the cows that might come in heat need to be observed closely.
- Decision making can be easily guided by use of a **Heat detection score chart**. This chart may help you to identify all the cows in the herd:
  - *who are in heat,*
  - *who will come or*
  - *haven't been in heat.*
- It can also tell cattle who is/are in heat right now

sign	value	Cow A	Cow B	Cow C
Restlessness	5			X
Drop in milk	5	X		
Swollen vulva	5			
Phleming	10			
Bellowing	10		X	
Mounted but not standing	10			
Fresh saliva on back	15	X		
Chin resting	20	X	X	
Back bending	30			X
Continuous clear discharge	30		X	
Sniffing other cow's vulva	30			
Mounting farmer	30			
Mounting or attempt other cows	40			
Mounting head side other cows	60		X	
Standing heat (stands when mounted)	100			X

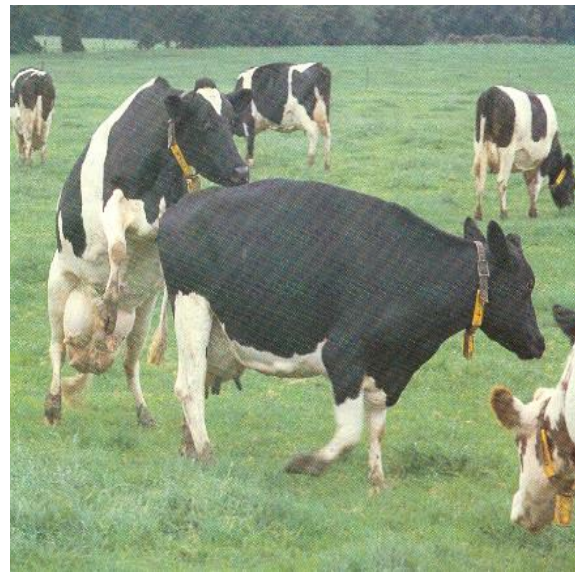
# Heat detection (Level 3)

**Example as aided by use of Heat detection score chart :** As soon as cow has scored 100 points because of several heat signs or showing standing heat (100%), then she is ready for service.



(30 points)

+



(40 points)

+



(30 points)

Total = 100 points (ready for insemination)



10	20	30	40	50	60	70	80	90	100
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# Heat detection (Level 3)

In case of Natural service (use of bull)...

- Allow the cow with the bull
- A cow naturally allows the bull to mate while standing still. It is very important that the cow is relaxed, and she voluntarily allows the bull to mount.
- When the cow comes in heat naturally, it will not be necessary to tie her. Tying the cow or securing her in a crush/ cowstand usually does not lead to the desired result. Securing/restraining often leads to stress.



**Note:** *If it is seen necessary to tie a cow because she doesn't allow the bull to jump/mount her, most probably she is not in heat.*



# Heat detection (Level 3)



## *Controlled mating*

- One jump is usually enough. If second jump is necessary, then make sure that there is enough time between the two jumps, preferably 30 minutes.
- **Remember:** Never force the cow to stand still to be mounted!

# Heat detection (Level 3)

## Post Heat (After heat)

- Cows can bleed after they have been in heat but not observed.
- Bleeding is a very positive sign. It means that your cow has been in strong heat and the uterus was clean and well restored. Some people still think it is a negative sign, which is not true.





# Heat detection (Level 3)

It is also important to keep observing your cow over the next coming weeks.

- Observe her for any visible signs of heat
- Check also if she is resting and eating



# Heat detection (Level 3)

## Checklist of farm herd Fertility status

- Here are some fertility Key Performance Indicators (KPIs) that may help you to optimize/improve the fertility status of the farm.
  1. % cows calved without assistance (ease of calving) – the higher the better for the herd. Ease of calving is related with dystocia
  2. % rate of dystocia (difficulty in giving birth) – the lower the better. Calving difficulty is associated with impaired reproductive performance (low fertility) resulting in more days open, services per pregnancy and more days to first breeding. Keep fertility records to keep trace of dystocia and cull cows that persistently are related with this.





# Heat detection (Level 3)



3. Detection of oestrus – Poor heat detection results in lengthening period to the next conception (more days open)

4. Hygiene at the time of calving – Inadequate hygiene may lead to infection of the reproductive tract. The infections result in lower pregnancy rates after first insemination and longer days between calving and conception.

*Others include:*

5. Days between calving and first heat

6. Days between calving and first mating/insemination

7. % cows pregnant after first mating/insemination

8. % cows with calving interval > 500 days

**Note:** Assessment of farm/herd fertility should not be based on a single criterion, but on a number of criteria in conjunction with each other

**-END-**