

Reproduction management in dairy goats

Webinar – 2022.07.12

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Seasonality of goat reproduction…

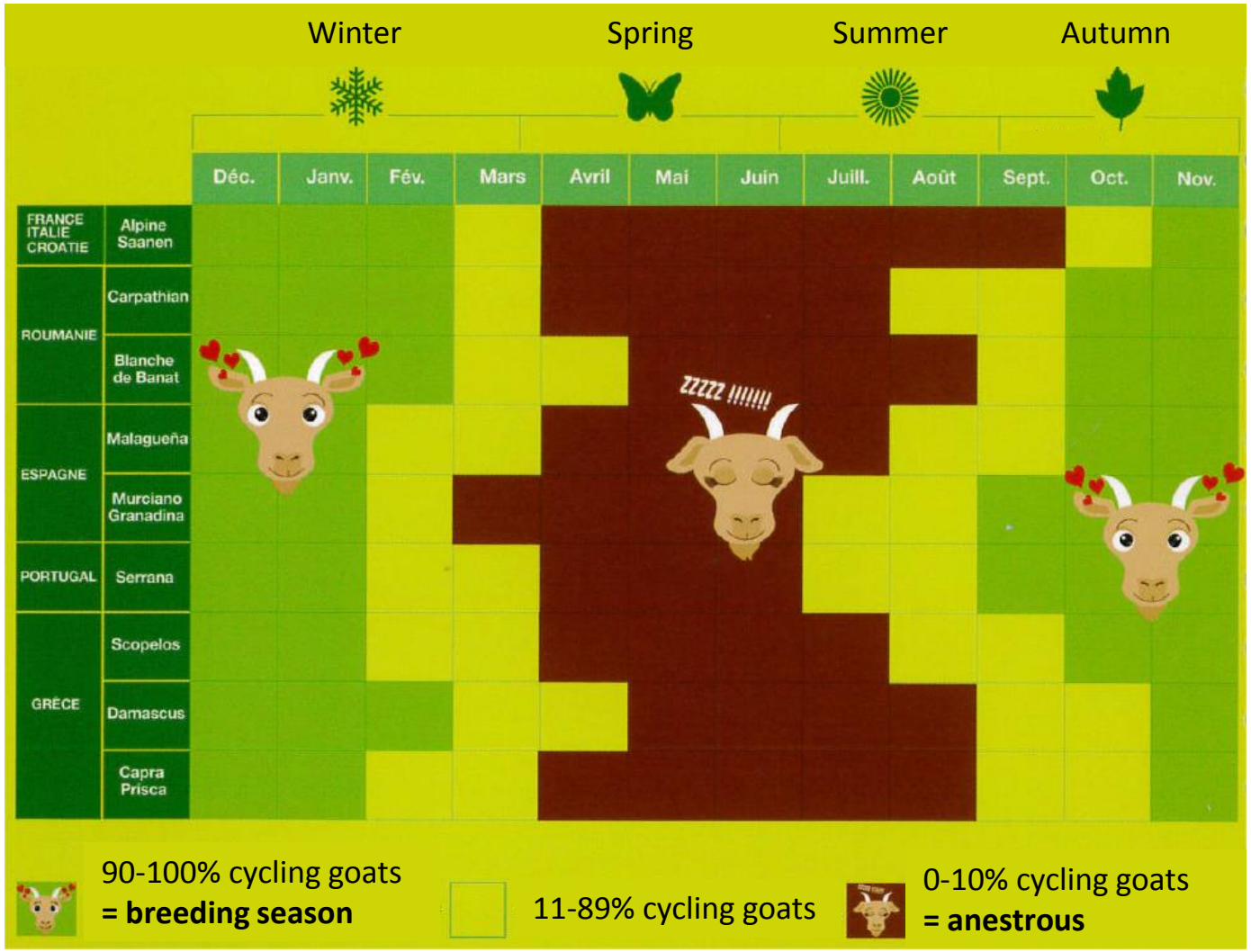
… is the basis of reproduction management.

Both males and females are seasonal, which means they undergo periods of sexual activity and periods of sexual rest.

Whether the goats are naturally cycling or not is the starting point to decide which protocol can be applied to prepare the goats for insemination.

Seasonality of reproduction…

→ ***Source*** *: Flock-Repro, 2013*



… for European breeds

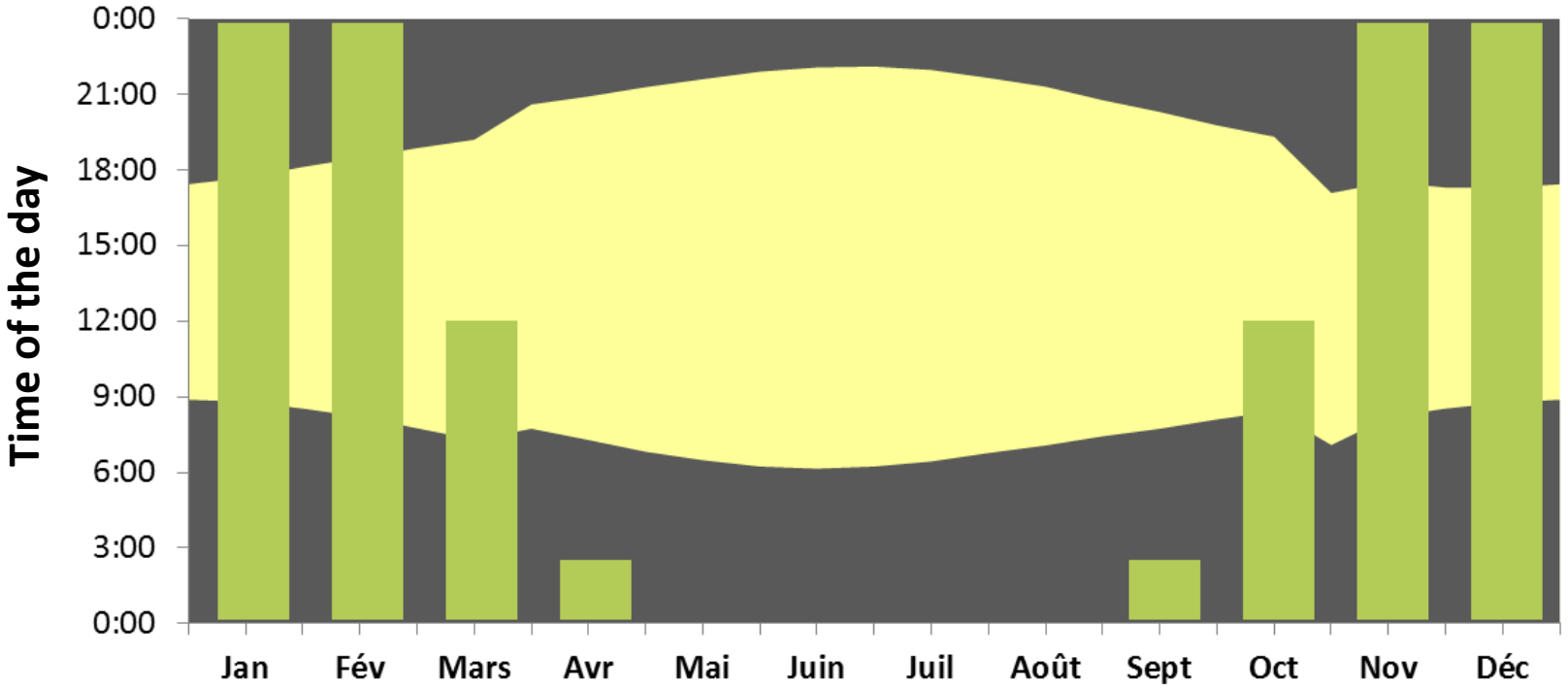
⇒ All European breeds are seasonal under our latitude

⇒ Alpine and Saanen are very seasonal with a long anestrous of several months

Seasonality of reproduction…

… is regulated by photoperiod

Photoperiod = the period of time each day during which an organism receives light



⇒ Reproduction is triggered when the days shorten - long days inhibit

Seasonality of reproduction…

… can be manipulated by photoperiodic treatment

- Bucks and goats must be treated

- Alternate long days and short days :
  - 90 long days = 3 months
  - 60 short days = 2 months

	Day length	Night length
Long day	16h	8h
Short day	12h	12h



200 lux at eye level

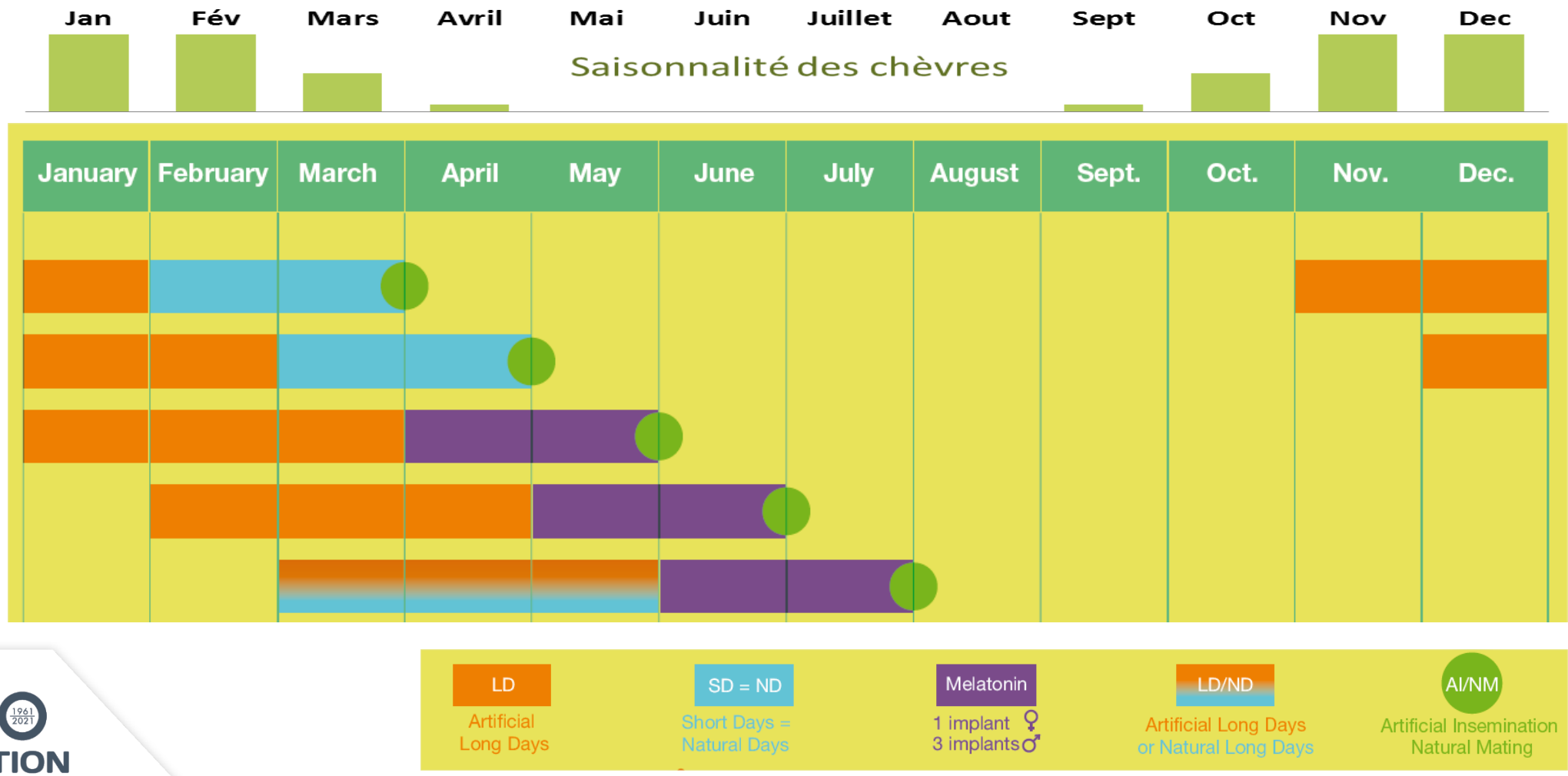


Complete darkness

Seasonality of reproduction…

→ ***Source*** *: Flock-Repro, 2013*

… can be manipulated by photoperiodic treatment



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The male effect…

… comes out very useful to control cyclicity in goats.

When goats are separated from the bucks for long enough, reintroducing bucks back into the batches of females will trigger ovulations.

Most breeders can observe this phenomenon when naturally mating their goats. However some rules must be respected to induce a satisfactory response for insemination.

The male effect…

… how does it work ?

Male effect = Introduction of males among a group of non-cycling but receptive females in order to induce and group heat and ovulations

Separation rules :



No sight – no smell – no hearing
For at least 2 months before reproduction
In separate barns, about 100m distance

Contact rules

Ratio of 1 ♂ per 10 ♀ ✓

Sexually active males ✓

Direct and unrestricted contact to enable natural sexual behavior ✓

Males with aprons or vasectomized ✓

Seasonality rules

Breeding season ✗

Just before natural breeding season ✓

Anestrous season ✓

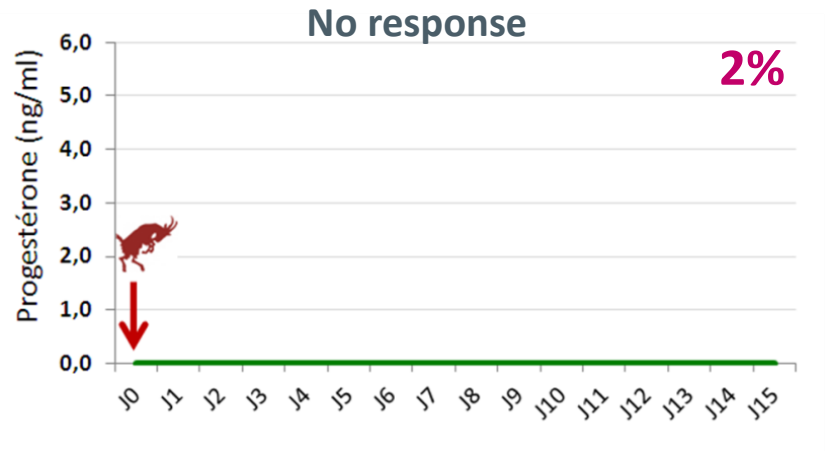
Photoperiodic treatment

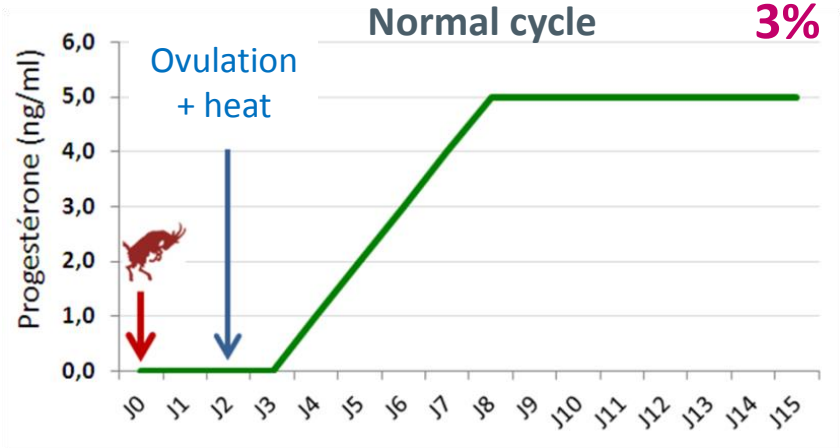
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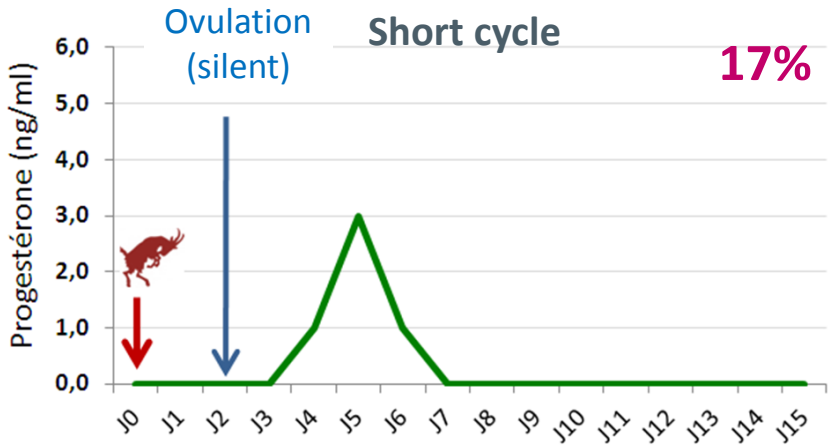
The male effect…

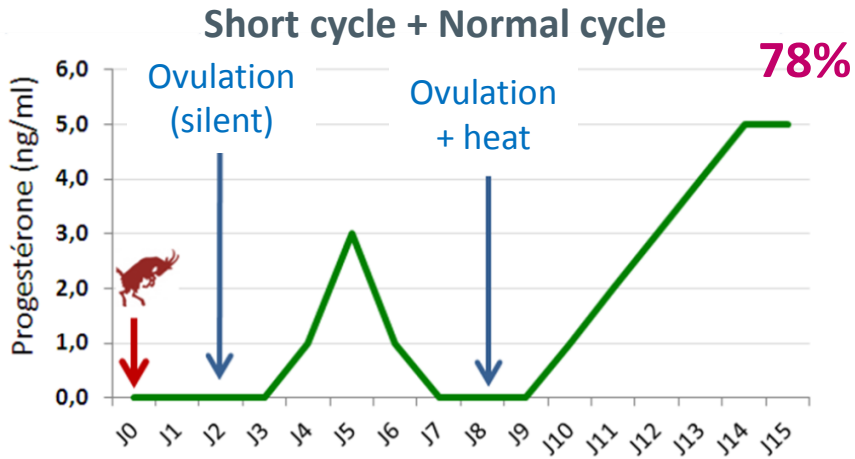
→ ***Source*** : adapted from Pellicer-Rubio et al., 2009

… what happens ?









Protocols for preparation to insemination…

… can be based on hormones or hormone-free.

Four different protocols are used in France with similar fertility rates.

They give different results in terms of ovulation grouping and prediction of insemination time and organization. Some can be used all year long (despite seasonality) an others not.

Protocols for preparation to insemination…

… can require more or less hormones

Synchronization hormonal treatment

Combination of sponge and male effect

Male effect protocol

Natural heat



With hormones

With less hormones

Without hormones

Protocols for preparation to insemination…

… the synchronization hormonal treatment

Synchronization hormonal treatment = hormones are applied to mimic a sexual cycle and induce synchronized ovulations for inseminations at a predetermined time



Sponge insert



Injections X2



Sponge retreat



Heat detection



Inseminations

D0 — D9 — D11 — D12 — D13

Progestogen :
Blocks ovulation

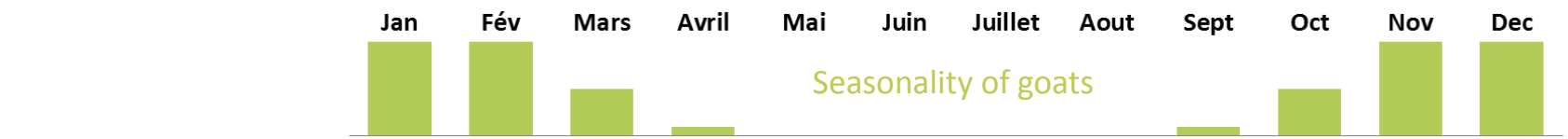
PMSG :
Induces follicular growth
Cloprostenol :
Luteolysis

Lifts the blocking

Systematic
43 hours

Protocols for preparation to insemination…

… the synchronization hormonal treatment



Alone	☺	☺	😐	😐	😐	😐	😐	😐	☺	☺	☺	☺
After photoperiodic treatment			☺	☺	☺	☺	☺	☺				



- ☺ Can be used all year
- ☺ Synchronizes ovulations (a few hours)
- ☺ AI at a predetermined moment
- ☺ Very good response (95% of goats)



- ☹ 3 different hormones
- ☹ Only induces one cycle

Protocols for preparation to insemination…

… the combination of sponge and male effect

Combination of sponge and male effect = same principle as the hormonal treatment, except that the injections are replaced by a male effect. The induced ovulations are synchronized and the inseminations are at a predetermined moment.



Sponge insert





Sponge retreat and
Buck introduction



Inseminations

D0 → D11 → D13

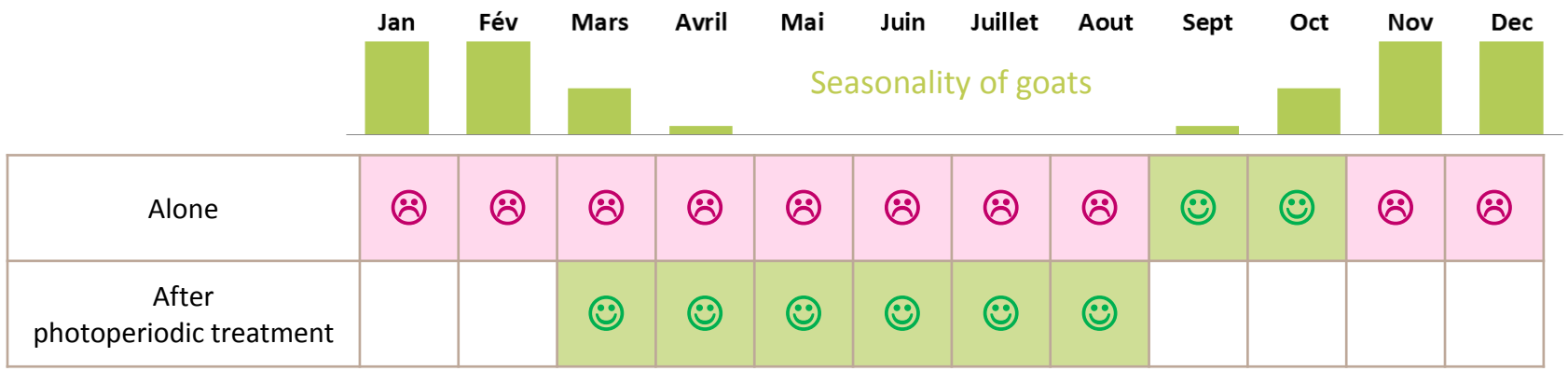
Progestogen :
Avoids short cycles

Systematic
52 hours

Induces and synchronizes
the ovulations

Protocols for preparation to insemination…

… the combination of sponge ant male effect



☺ Synchronizes ovulations (a few hours)
☺ AI at a predetermined moment
☺ Very good response (95% of goats)
☺ No PMSG

☹ 1 hormone
☹ Can't be used on cyclic goats
☹ Requires male effect conditions

Protocols for preparation to insemination…

… the male effect protocol

Male effect protocol = Deliberate introduction of bucks in a batch of non cycling but receptive goats in order to induce ovulations. The inseminations are grouped over one week and are done after heat detection.



Buck introduction



Heat detection



Inseminations

D0 → D5 to D9 → D6 to D10

Induces cyclicity

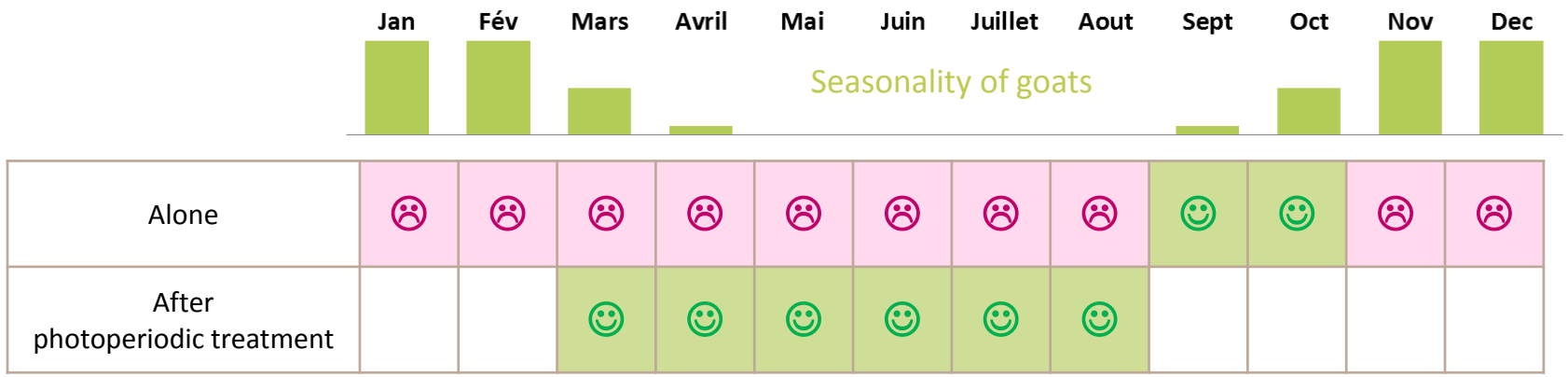
12 to 36 hours
After marking

Allows to know which goat has responded an when to inseminate

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Protocols for preparation to insemination…

… the male effect protocol



☺ Hormone-free
☺ Groups ovulations (a few days)
☺ Good response (80% of goats)

☹ Can't be used on cyclic goats
☹ Requires male effect conditions

Protocols for preparation to insemination…

… natural heat

Natural heat = Introduction of bucks in a batch of cycling goats during breeding season. The bucks have no effect on the ovulations and used to detect heat.



Buck introduction



Heat detection



Inseminations

D0 → D0 to D21 → D1 to D22

12 to 36 hours
After marking

Protocols for preparation to insemination…

… natural heat



☺ Hormone-free
☺ Allows insemination during natural breeding season

☹ Ovulations are not grouped
☹ No inducing so possible variability

Protocols for preparation to insemination…

… resumed

Protocol	Hormones	Use	Ovulations	Heat detection	AI moment
Synchronization hormonal treatment	3	Anestrous S. ✓ Pre-breeding S. ✓ Breeding S. ✓	Synchronized	Facultative	Predetermined
Combination of sponge and male effect	1	Anestrous S. ✓ Pre-breeding S. ✓ Breeding S. ✗	Synchronized	Facultative	Predetermined
Male effect	0	Anestrous S. ✓ Pre-breeding S. ✓ Breeding S. ✗	Grouped	Compulsory	Over 1 week
Natural heat	0	Anestrous S. ✗ Pre-breeding S. ✗ Breeding S. ✓	No grouping	Compulsory	Over 1 month

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Thank you



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