ANTI-MÜLLERIAN HORMONE SECRETION IN DOE KIDS

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Success of 1\textsuperscript{st} breeding is a major concern

Fertility rates after artificial insemination:
• highly variable
• and low, around 40\% (Idèle, 2012).

Breeders consider two main criterias before breeding their does:
• age > 5 months
• weight > 32 kg

There is no known hormonal marker for sexual precocity.
ANTI-MÜLLERIAN HORMONE

- Anti-Müllerian hormone (AMH) is produced by granulosa cells on antral and pre-antral follicles.
- AMH is used in human medicine as a marker of the ovarian reserve.
- In cows and goats, AMH is a predictive endocrine marker of the response to a superovulation treatment and further embryo production (Monniaux and al., 2011).
ANTI-MÜLLERIAN HORMONE

In ewe lambs, Lahoz et al. (2012) showed that AMH plasmatic concentration at 3,6 months of age was a predictive marker of fertility at first breeding.

In their experimental conditions, they could determine a threshold level allowing discrimination between low/high fertility potential ewe lambs (92pg/mL).
OBJECTIVE OF THE STUDY

• The main objective of this study was to monitor AMH secretion variations from birth to first reproduction on doe kids and to confront AMH values at a given age to first reproduction fertility rates.

• The long term objective is to assess the predictability of sexual precocity and fertility with AMH plasma levels in young nanny goats.
EXPERIMENTAL DESIGN

Experiment 1 = INRA experimental flock (PATUCHEV)

- 30 does born in November
- Monthly monitoring of:
  - AMH plasmatic levels,
  - Weight and chest width.
- Transrectal ultrasonography twice before breeding for follicular activity monitoring
- Bred during non-breeding season:
  - AI mid-June
  - Bucks from 3rd July until 2nd August
EXPERIMENTAL DESIGN

- Experiment 2 = in a private farm
  - 110 does born from AI during late September
  - AMH assays at age 3 months and 6 months (± 4d)
  - bred with bucks during seasonal anoestrus
MONTHLY MONITORING
EXPERIMENTAL FLOCK

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Weight monthly variations

\[
y = 0.1691x + 4.7499 \\
R^2 = 0.9677
\]
Chest width

\[ y = 5.0691x + 46.199 \]

\[ R^2 = 0.9725 \]
Individual AMH plasmatic level per month

AMH plasmatic concentration (pg/mL)

M0 M1 M2 M3 M4 M5 M6

0 500 1000 1500 2000

13001 13002 13003 13004 13005 13006 13007 13008 13009 13010 13011 13012 13013 13014 13015 13016 13017 13018 13019

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Mean AMH plasmatic level (n=31)
Experiment 1 = monthly monitoring

AMH secretion seems to follow a pattern
Levels are higher than in lambs

In spite of photoperiodic treatment + melatonin, cyclicity had not resumed at the time of synchronisation (assessed by ultrasonography)

Fertility was very low after AI (~25%) so further fertility results with bucks are needed to better assess the predictive value of AMH plasmatic level
2 AMH LEVEL AT GIVEN AGE / FERTILITY
PRIVATE FARM

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Fertility

n = 107 does
(complete breeding info + AMH samples)

- 5 pseudopregnant
- 11 non-pregnant
- 91 pregnant

Global fertility = 85%
AMH plasmatic level and fertility

AMH plasma concentration in prepubertal goat (pg/mL)

- Pregnant
- Non-pregnant
- Pseudo-pregnant

- 3 months
- 6 months

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AMH plasmatic level and litter size (assessed by echography)
Experiment 2 = predictive value of AMH at 3 or 6 months of age

High fertility does not allow us to find a significant difference between AMH levels of pregnant and non-pregnant does

Results seem inversed as compared to lambs (higher value = lower fertility)

AMH level at 3 and 6 month of age does not seem predictive of litter size
Perspectives under progress…

- Further thorough analysis of AMH / fertility correlation
- Monthly monitoring on a group of doe kids to be bred during breeding season
THANK YOU for your attention

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