Immunomodulation for Fecundity enhancement/Immunocontrol

Prof G N PUROHIT
Prolific sheep/Goats

- Garole - Avishan
- Black Bengal goats
## Reproductive performance of prolific breeds - ranges between different flocks, populations and years

<table>
<thead>
<tr>
<th>Breed</th>
<th>Country</th>
<th>Age at first oestrus (months)</th>
<th>Age at first lambing (months)</th>
<th>Lambing interval (months)</th>
<th>Litter size First lambing</th>
<th>Later lambings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbados</td>
<td>Barbados</td>
<td>14–22</td>
<td>6–9</td>
<td></td>
<td>2–2.3</td>
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<tr>
<td>Blackbelly</td>
<td>Elsewhere</td>
<td>5–8</td>
<td>6.5–9</td>
<td></td>
<td>1.5–2.0</td>
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<tr>
<td>White Virgin Island</td>
<td></td>
<td>13–14</td>
<td>6–8</td>
<td></td>
<td>1–2</td>
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<tr>
<td>Priangan</td>
<td>Indonesia</td>
<td>6–12</td>
<td>6–9</td>
<td></td>
<td>1.4–2.1</td>
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<tr>
<td>East Javanese Fat-tailed</td>
<td>Indonesia</td>
<td>6–12</td>
<td>6–9</td>
<td></td>
<td>1.6</td>
<td></td>
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<tr>
<td>D’man</td>
<td>Morocco</td>
<td>12–18</td>
<td>6–7</td>
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<td>1.6–2.0</td>
<td>1.8–2.7</td>
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<tr>
<td>Hu-yang</td>
<td>China</td>
<td>13–16</td>
<td>6–8</td>
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<tr>
<td>Svanka</td>
<td>U.S.S.R.</td>
<td>6+</td>
<td></td>
<td></td>
<td>2–4</td>
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<tr>
<td>Chios</td>
<td>Greece</td>
<td>13+</td>
<td>6–12</td>
<td></td>
<td>2.3</td>
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<tr>
<td>Finnish Landrace</td>
<td>Finland</td>
<td>7–8</td>
<td>7–12</td>
<td></td>
<td>1.9</td>
<td>2.7</td>
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<tr>
<td>Finnish Landrace</td>
<td>Elsewhere</td>
<td>5–10</td>
<td>7–10</td>
<td></td>
<td>1.5–2.2</td>
<td>2–3.2</td>
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<tr>
<td>Romanov</td>
<td>U.S.S.R.</td>
<td>7–18</td>
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<td>Romanov</td>
<td>France</td>
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<td>2.6–3.3</td>
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</tr>
</tbody>
</table>
SHEEP/Goat

• Flushing

• Immunoneutralization of androstendione

• Inhibin Immunogens
• Feeding the ewe so she is gaining weight about 2 weeks before breeding is called **flushing**. **Flush**ing may increase lambing percentage by increasing the number of eggs that the ewe ovulates. **Flush**ing works best on thin ewes (BCS < 2.0). ... Mature ewes respond better to **flushing** than yearlings.

• No benefit is seen in animals with excessive Body Condition Scores (BCSs) or during the height of the normal breeding season. Overly thin animals also do not respond to flushing. Does and ewes that are maintained in very good condition on relatively high levels of nutrition throughout the year are less likely to respond to flushing.
• Androvax - MSD
• Ovastim - Virbac
• Fecundin - Coopers Animal Health Now withdrawn
Not recommended for Merino ewes

Vaccination 5 and 2 weeks before mating

Repeated annually 2 weeks before mating

Reduces estrogen and Increases FSH thus increasing ovulatory rates and fecundity
Inhibin Neutralization

- Inhibin conjugates
- Inhibin anti-serum
Reproduction control vaccines

- Immuno-contraception
  - Prevent all sexual behavior and fertility
  - Antibodies against GnRH- so called GnRH vaccines useful for domestic animals

- Immuno-neutering
  - Do not prevent sexual behavior yet prevent fertilization
  - They are oocyte antigens react with zona pellucida of many species and prevent fertilization useful for wild species
GnRH Vaccines

• Cattle

• Vaxstrate – Northern Australia 2 doses are required launched in 1980 withdrawn in 1996 because of being reactogenic

• Bopriva – Pfizer Prevents estrus for 191 days

• 2 vaccines 3-7 weeks apart prevents estrus and ovulation for 3 months Useful for Alpine/Feedlot cattle and Bulls
THE BENEFITS OF BOPRIVA.

Boprina may result in improvements in the following behaviours:

- Fighting
- Sexual mounting
- Damage to infrastructure
- Pawing, digging and pasture damage
- Bellowing
- Dominance and territorial behaviour
Female horses

• Equity – commercialized in 2001 in Australia

• IUDs

• Marble balls A study was reported in which marbles were inserted into the uterus of mares for suppression of estrus. In the study, 35-mm ('shooter size') glass marbles were sterilized in an autoclave and subsequently a single marble was placed into the uterus of each of 12 mares.
Gonacon

- Used for Deer, bison, wild
- Horses and camels
- Approved for use in some countries
Boars

• Improvac

• To prevent the boar taint
• 2 doses 4 and 8 weeks before
• Slaughter reduces skatole and
• androstenedione
Porcine zona pellucida vaccine

- Spay Vac
- Immunocontraception
- Vaccine

- Surface antigens block the entry of sperms in an oocyte
Sperm is not permitted to enter and fertilize the egg.

Antibodies prevent sperm from interacting with zona pellucida.

Pryor wild 2010
Dogs

- 30 million stray dogs worldwide
- 20,000 people die of rabies annually
- 35% of world's human deaths because of rabies are in India
- Kill more than terror attacks
Canine Gonadotrophic releasing factor immunotherapeutic

- Immunocastration in male dogs
- Therapy of BPH
- Repeat every 4 weeks
- Neutresol – zinc gluconate solution injected intra-testicular causes atrophy of testes and permanent infertility
- Adverse reactions – testicular swelling, ulceration
Bitches

• Oral synthetic progestins-regular dosing required
• GnRH agonist implants – Suprelorin
• Need replacement every 6 months
GnRH agonist Nafarelin
• Gonazon is injected subcutaneously, in the region of the umbilicus. The implant may be administered to bitches from the age of four months (blocking reproductive function for an average of 12 months) to 6 years (blocking reproductive function for an average of 11 months).
GnRH antagonists

- A GnRH antagonist binds to and blocks GnRH receptors on the pituitary gland, and the suppression effect is instant. Common preparations of GnRH antagonists include cetrorelix (Cetrotide®) and ganirelix (Orgalutran®), which are both administered as subcutaneous injections.
• The above lectures are also explained in video lectures at my YouTube Channel Govind Narayan Purohit

• Kindly share the videos and subscribe to my channel if you like them

• Thanks