

# BEHAVIOURAL CONTROL OF MILK LETDOWN

Marie-Noel Bruné

# **Nursing and suckling behaviour**

Transportation of milk from mammary gland  
to the stomach of young.

# Generalities

- Calves suck 6 to 10 times daily (n° decreases with age)
- Piglet: 20-24 times/day
- During intervals, milk is stored in sinuses, cisterna
- As milk accumulates, pressure in mammary gland increases
- Sows' cistern is smaller than cows', so piglets suck more frequently than calves.

- To help expulsion of milk from mammary gland: 2 types of tissue:
  - Myoepithelial cells (oxytocin-pituitary)
  - Smooth muscle (stimulated by nerves)
  
- However, oxytocin can be active in parturition, in coitus: pleasant experience:
  - Pleasure sensation of oxytocin
  - Diminution of mammary pressure
  - Tenderness in gland filled with milk.

# SUCKLING

- Passive withdrawal:
  - Young massages mamma
  - May be started by:
    - Young (hunger)
    - Mother (gland discomfort)
  - As he gets older, mother less tolerant
- Milk Ejection Process (Milk Letdown)

# MILK LETDOWN

- Reflex (unconscious)
- Acts under stimulus
- Neuroendocrine path that passes via peripheral and central nervous systems to hypothalamus and pituitary (output of oxytocin). Oxytocin goes through blood to udder: milk pressure.

## ➤ **Activation:**

- Vigorous nosing of udder by young
- Slight delay (time for oxytocin to circulate) – young remain stationary
- Other activators: odour, sounds, visual stimuli

## ➤ **Milk letdown:**

- Loud noises
- Electric shocks (before milking starts)
- Sights

- During ejection: milk flows into mouth of young
- Calves, babies and piglets swallow (tongue chases milk) don't suck
- After ejection: milk flow ceases and can only be reinitiated after new flow of oxytocin



## ➤ **Oxytocin action:**

### General on myoepithelium

- Suckling human or calf: deal with mammae simultaneously
- Multiple: must all be present at same time
- Pigs: mother doesn't release milk until all are ready

Humans: sucking baby at one breast can elicit a response from the other.

# Termination

- If milk not removed while oxytocin is active: not available until system refurbished
- Milk is like coitus: oxytocin important for both
- Suckler attempts to draw last drops of milk (massage, suckling)
- 5 to 10% milk remains in gland: will come out in next milking session

# NURSING AND SUCKING BEHAVIOUR

## Cow

- Milk ejection innate but must be maintained
- Sometimes requires sight of calf first
- Calf suckles 75 times / min
- Cows suckling multiple calves: 15-20 suckling bouts / day
- Suckling position: between back and front legs, body along that of the cow. Calf moves tail: satisfied
- Cow: not too demonstrative

# Pigs

- Sows suckle litter hourly
- Roused by one or two awoken members:
  - If willing to be sucked: rolls on her side and exposes 2 rows of teats

# 5 phases in suckling (pigs)

- Phase 1: Piglets reach nipple (20-60 secs)
- Phase 2: Nosing mamma with head (30-40 secs) – triggers oxytocin release – Restaurant hypothesis (more massage, more milk)
- Phase 3: Quiet for 20 secs
- Phase 4: Milk flow lasts for 10-20 secs (rapid mouth movements). Swallow milk (30-50 ml)
- Phase 5: Drawing on teat

Sow turns and covers her nipples

# Meanwhile...

## Sow grunts

- Specially in phase 3
- Lower in phase 4
- Silent in phase 5
- Grunt rate: **external indicator of oxytocin release** from posterior pituitary
- Weaning: begins 10 days post-partum: fast food hypothesis (less time for massage, less milk).

# Lactation behaviours

Suckling can also be affected by:

- Feeding
- Drinking
- Sex