



# Recommendations for an optimal start of rearing

**Gert van Trierum**  
International Product Manager  
milk replacers for rearing



G R O E I E N   D O E   J E   S A M E N



# What is your approach ?



Do you already have all pieces for rearing of goat kids correctly arranged ?







# Goat kids as a basis of your operations



G R O E I E N   D O E   J E   S A M E N



# Objectives

- Genetic improvement of goats
- Genetic programming of goat kids
- Low mortality and high uniformity
- Minimum requirement of medication
- Well-functioning immune system
- Sound respiratory and intestinal system
- Well-functioning rumen
- Balanced growth
- High efficiency of labor
- Economically sustainable
- Pleasure





# Hidden losses

- Rearing of unnecessarily high number of goat kids because of too high mortality and/or bad results of rearing
- Low annual and lifetime production of dairy goats because of introduction of goat kids with poor production capacity, vitality and immunity



# Preparation: 4-way commitment !

Farmer

Feed supplier

Veterinarian

Milk replacer supplier



# Features of goat kids

Vitality

Hygiene status

Iron / Vit. E status

Immune system



Oesophageal groove reflex

Development of rumen and abomasum

Ruminant

Feed and water intake



# Birth – care for the goat kid

Focus → Minimum infection

- Problems affecting the goat reduce the vitality of the lamb
- Check for blockage of respiration by mucus or foetal membranes
- Ensure proper hygiene around lambing: manure, goat and environment contain all causative agents for diarrhea (e.g. *E. coli*, *Cryptosporidium*)
- Correctly disinfect the umbilical cord
- Disinfectants prevent diarrhea and umbilical infections



# Birth – care for the goat kid

Dry place for parturition

Minimal assistance

Immediate separation from the mother

Disinfection of the umbilical cord

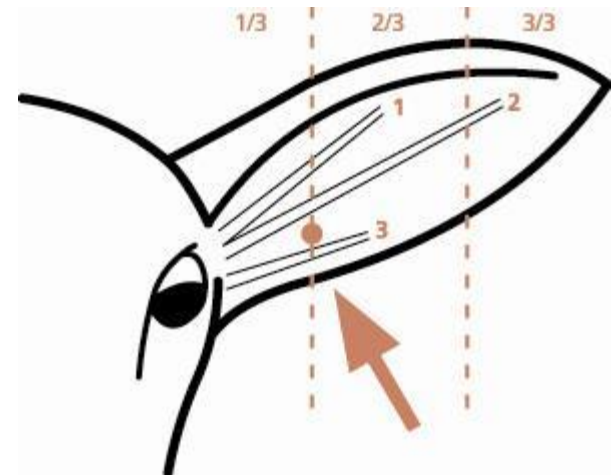


# Disinfection of the umbilical cord





# Ear tagging and disinfection!



# Reception facilities 1st day

## Reception first day

- Hygiene
- Climate
- Labor efficiency

## Reception protocol

- Prevention of infections (e.g. of navel)
- Colostrum supply
- Medication?
- Vitamins/Minerals/Trace elements



# Care, colostrum & heat for a perfect start



Or even better cardboard boxes on a heating floor

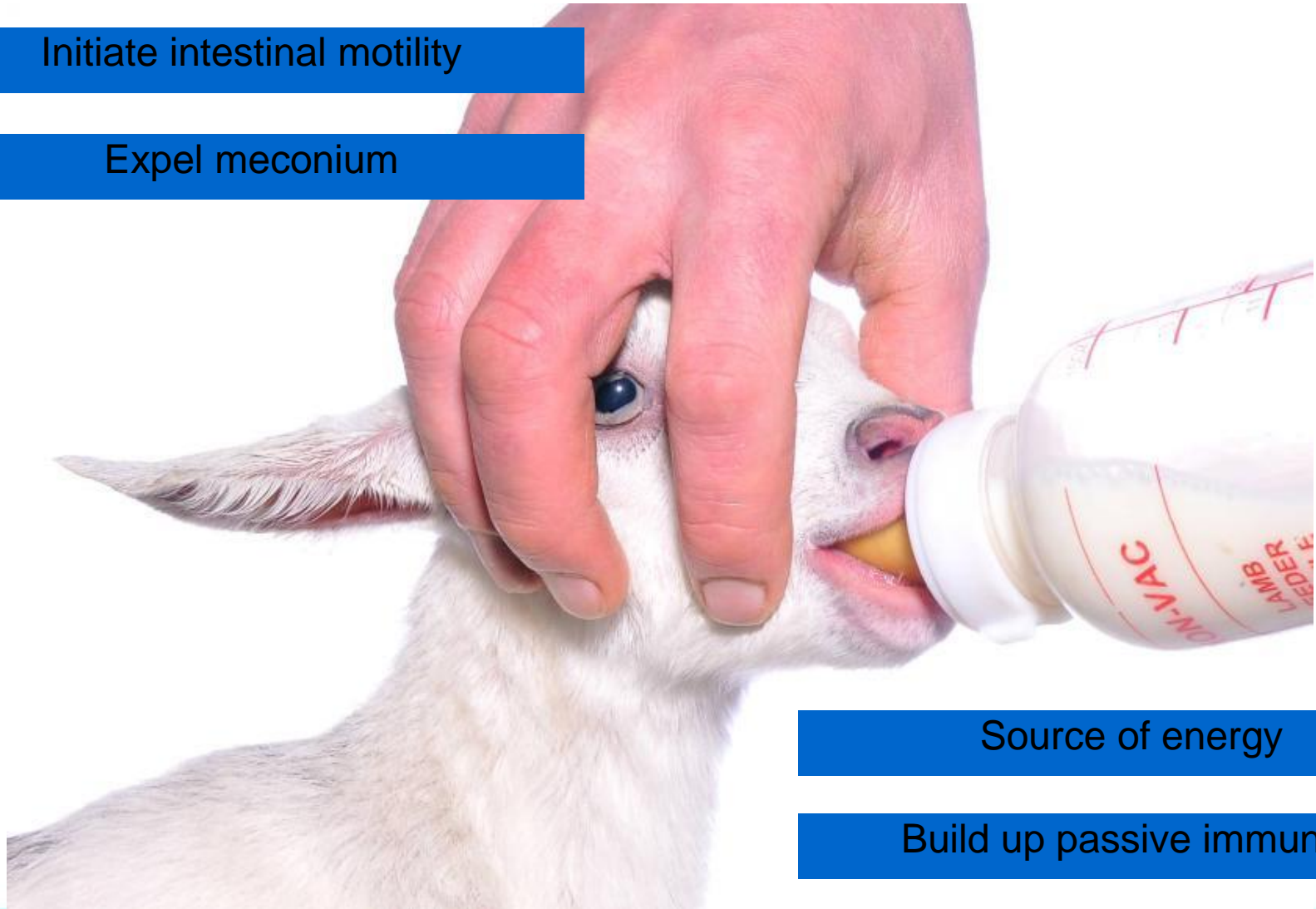




# Functionality of colostrum

Initiate intestinal motility

Expel meconium



Source of energy

Build up passive immunity



Fast

Fit (high) volume

Frequent

Fresh

As early as possible

Total of 15 % of BW

3 times daily

Check quality

# Check quality





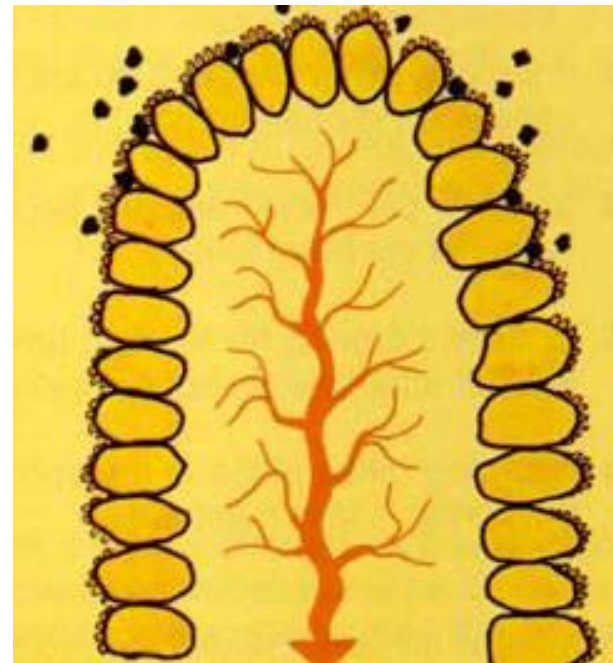
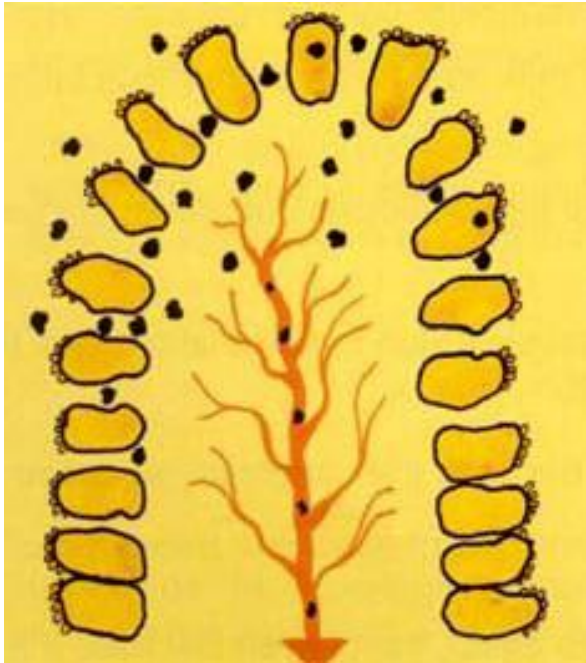
# Method of application



# Heating of colostrum: Be careful!

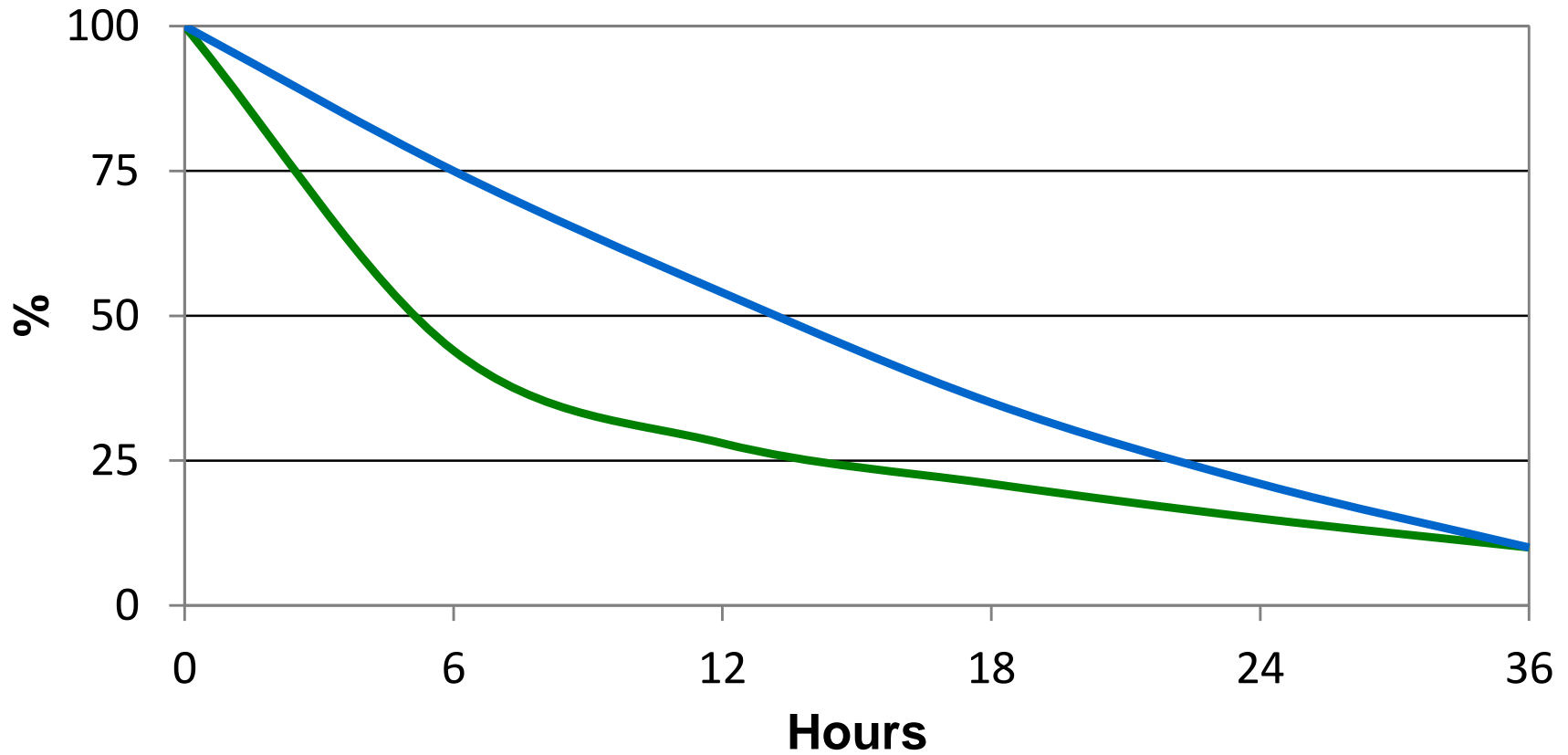


# Permeability of the intestinal wall





# Fast

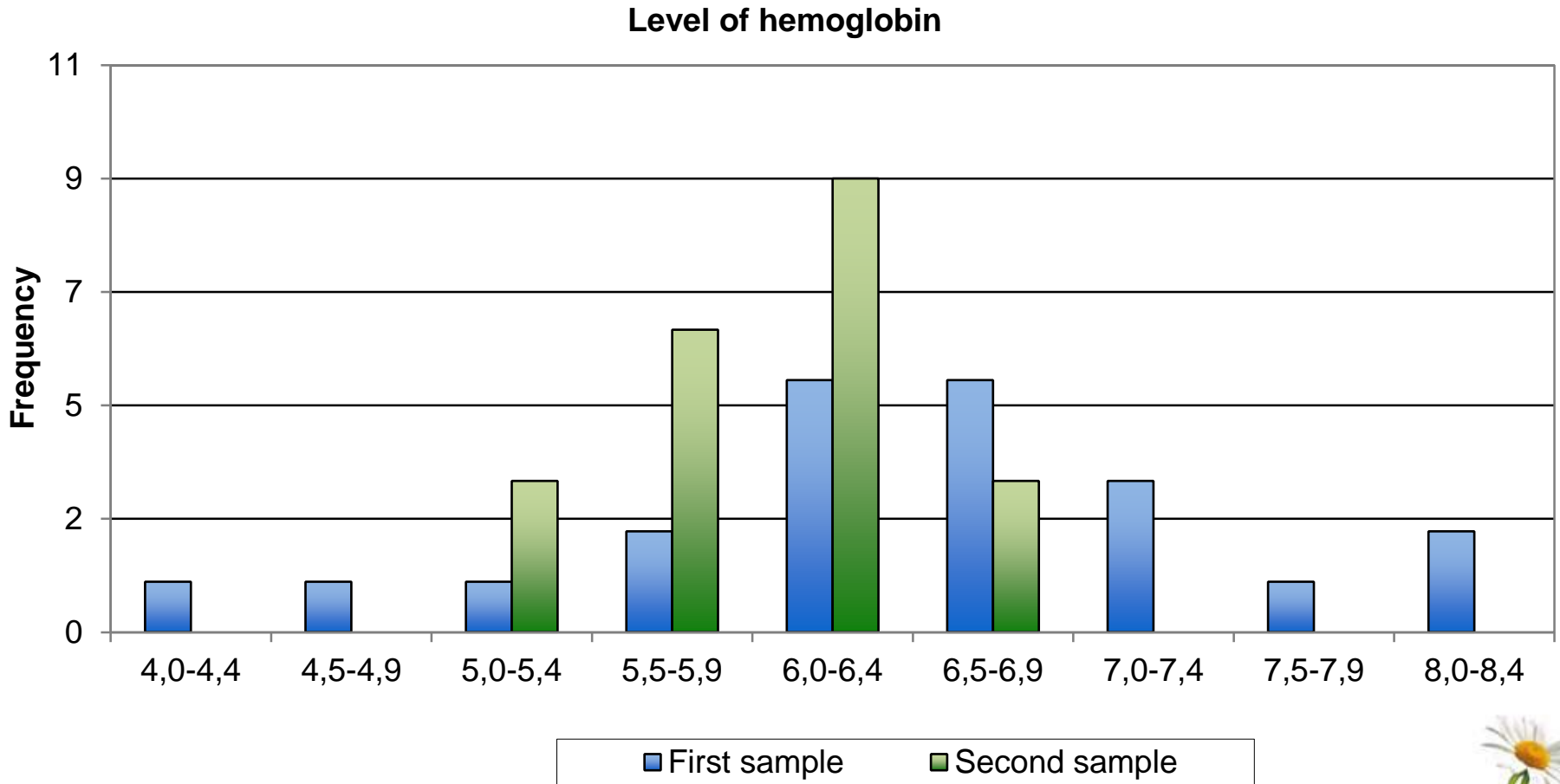


— Absorption capacity      — Colostrum quality



# Results of Hb-analysis

at 3 and 43 days in 21 goat kids fed with Denkamilk Caprimel



# Extra vitamins, minerals and trace elements can be necessary

- Directly starting from day 1 mixed into the milk (replacer)
  - 0-10 dys: 2.5 g/animal/day
- As top-dressing on the feed/concentrate around weaning
  - 7-10 days 2.5 g/animal/day
- After antibiotic treatment
  - 7-10 days

- Vitamins:
  - A, B-complex, C, D3, E, K
- Minerals & Trace elements
  - Fe, Cu, Zn, Co, Se, Mn, Mg, I





# Training pen

## Sufficient intake

- Short distance to teat
- Connect to teat 2-3 times daily
- High concentration (180 g/liter)

## Easy intake

- Max. 10 - 15 goat kids per teat
- Min. 2 teats at 35 - 40 cm height
- Close to the automatic feeder
- Vertical teat opening (optimum milk yield)

## Avoid (re)contamination

- In training pen until day 4 of life
- Replace/separate animals with insufficient intake to a separate pen
- Temperature (bedding), climate (humidity)



# Training pens for at least 4-5 days



## Training pens





# Feeding strategy

- Prompt and safe start
- Harmonious / optimal growth
  - Maximum does not necessarily mean optimum !
  - Growth from milk and concentrates
    - Correct protein / fat balance
    - Concentration
- Optimum weanability:
  - no post-weaning growth check
    - Sufficient intake of concentrates and roughage
    - Avoid too low age / too low weight / insufficient buildup of immunity





**Speaking  
about  
Milk replacer**

**Denkamilk**



G R O E I E N   D O E   J E   S A M E N



# Denkavit

- **Dutch family owned company (since 1929)**
- **Specialized in:**
  - Feed for young animals ( $\pm$  420.000 MT feed/year)
  - Special ingredients for compound feed industry
  - Veal calves ( $\pm$  500.000 calves in integration in Europe)
- **International active:**
  - Export: > 50 countries worldwide
- **Research facilities** in the Netherlands and France for calves, piglets, kids and lambs
- **Turnover of € 600 million/year**





# Research station The Netherlands and in France.



3040 calves  
230 sows  
6500 piglets



1.300 calves in France



# Capacity digestion tract is starting point.

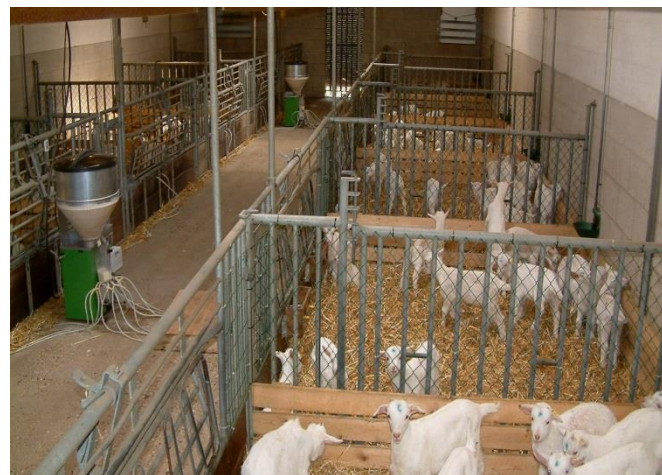


Digestibility studies kids & lambs





# Research capacity of ca. 700 kids per year feed and feedsystem trials.





# Denkamilk goat kid milk replacer

Corresponding factors:

- Origin of raw materials:
  - Selected for taste / solubility / digestibility
- Production process
- Structure and free flowing characteristics
- Compositions proven in practice
- Safety concept (acidification, prebiotic, mixture of essential oils)
- Correct vitamin levels
- Based on extensive digestibility trials



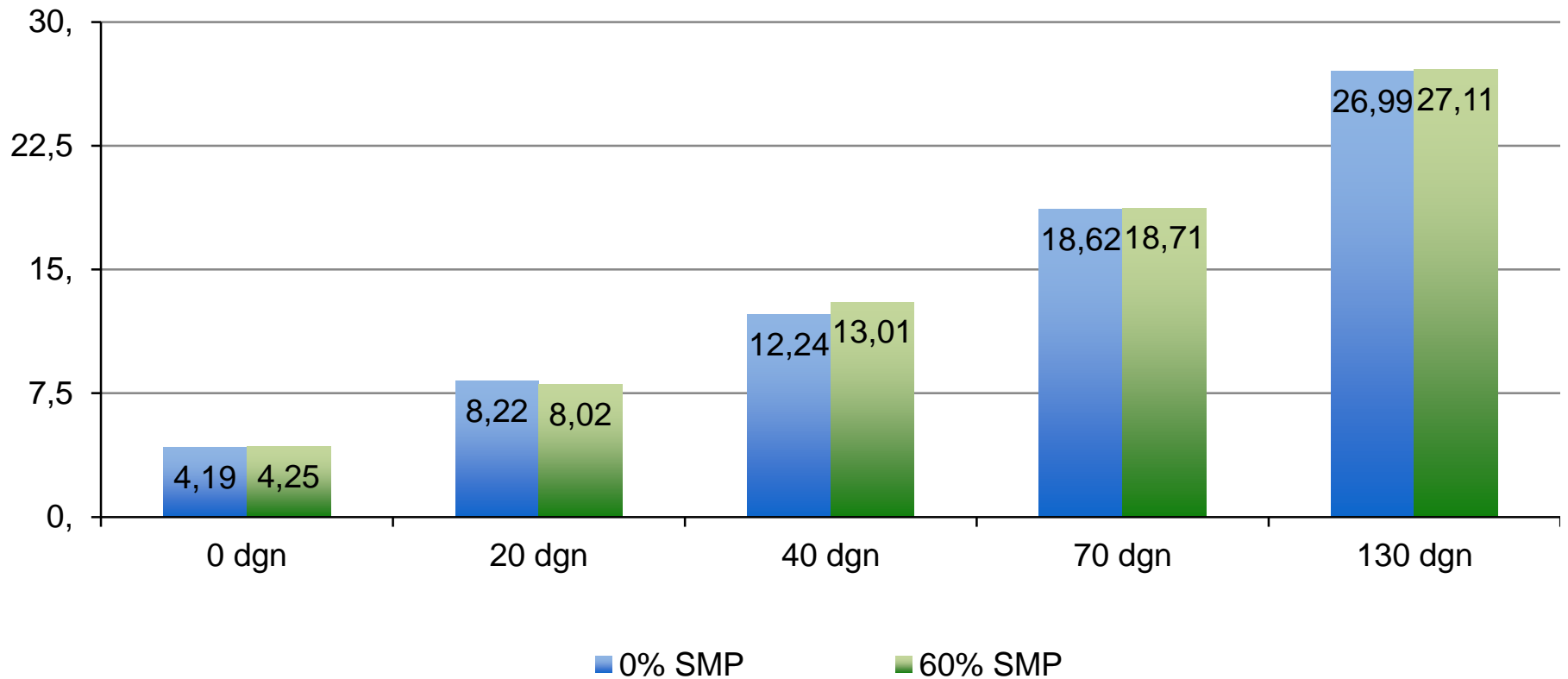
# Research of weight development





# Research of weight development

Institut expérimentale Caprine du Pradel France  
Female and male goat kids





# Analysis of technical results

	0% SMP	60% SMP
<b>ADG (gram)</b>	<b>236</b>	<b>228</b>
<b>Weaning age (days)</b>	<b>50.32</b>	<b>49.29</b>
<b>Weaning weight (kg)</b>	<b>14.93</b>	<b>14.89</b>
<b>FCR</b>	<b>1.298</b>	<b>1.367</b>







# Technical results male goat kid fattening

	0% SMP	60% SMP	
<b>Number</b>	<b>34</b>	<b>33</b>	
<b>Birth weight (kg)</b>	<b>4.72</b>	<b>4.89</b>	<b>Ns</b>
<b>Age at slaughter (days)</b>	<b>26.06</b>	<b>24.45</b>	<b>Ns</b>
<b>Live weight (kg)</b>	<b>10.94</b>	<b>10.56</b>	<b>Ns</b>
<b>ADG (gram)</b>	<b>241</b>	<b>232</b>	<b>Ns</b>
<b>Carcass weight (kg)</b>	<b>7.30</b>	<b>6.98</b>	<b>Ns</b>
<b>Carcass efficiency</b>	<b>66.73</b>	<b>66.12</b>	<b>Ns</b>

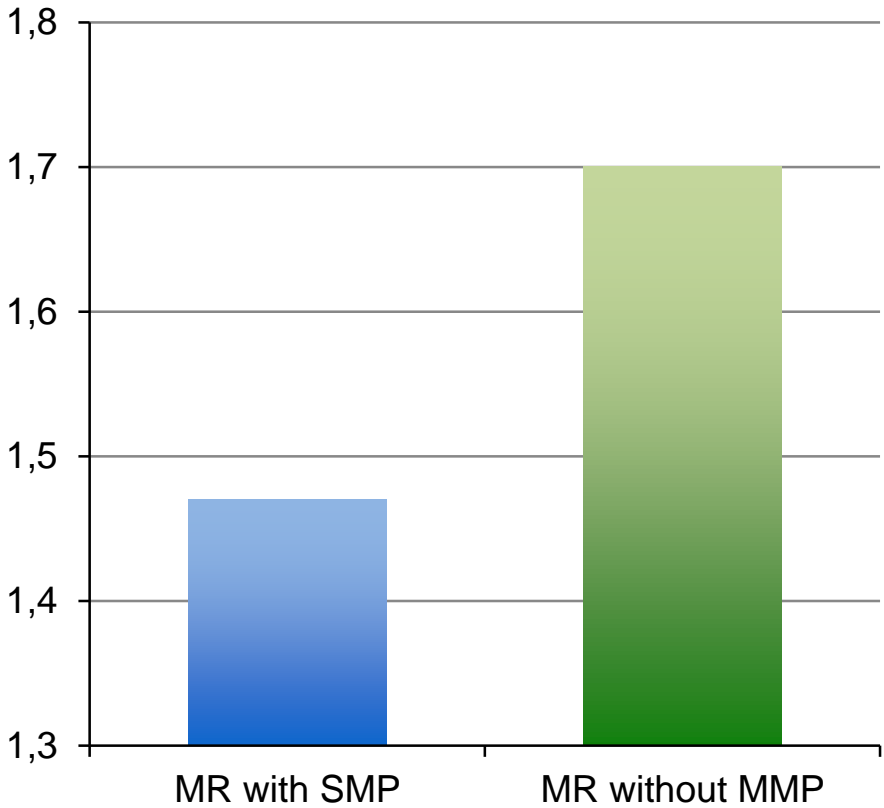


# Carcass quality



# Research of concentrate intake

0-28 days



# Milk replacer: whey vs smp

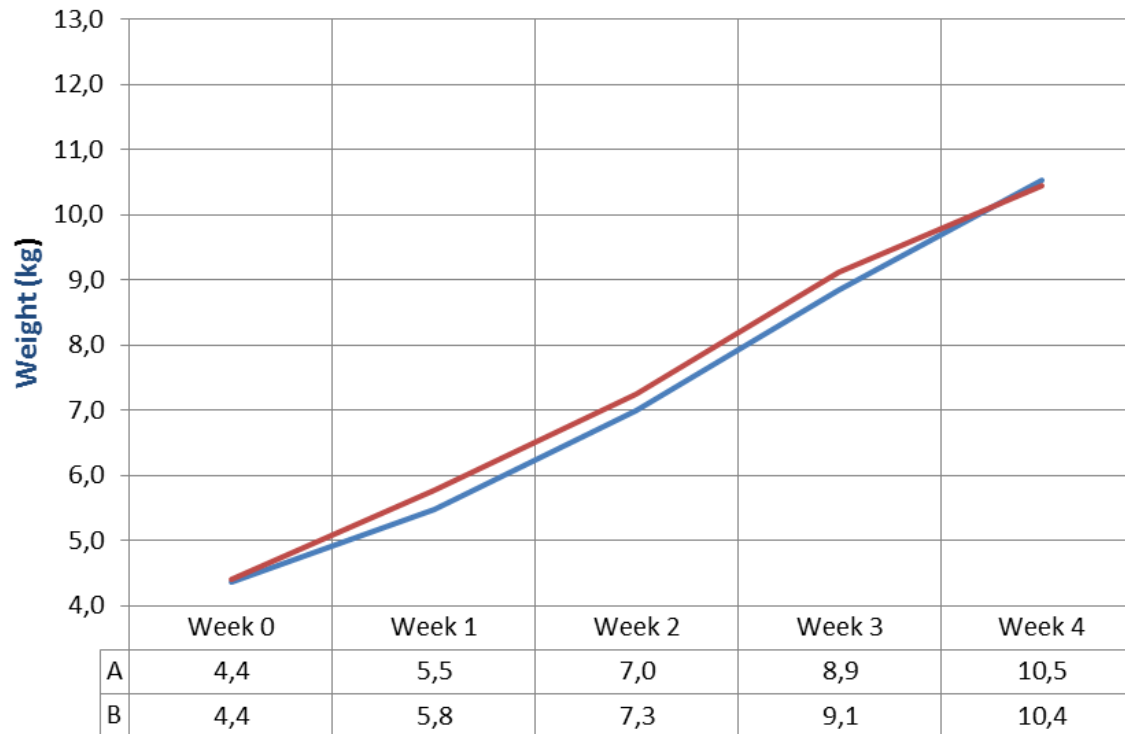
- No/less risk of coagulation disorders
  - Milk without SMP does not require coagulation
  - One less risk factor
- Lower risk of scours
- Earlier intake of concentrates and roughage
  - Facilitates earlier weaning !
- Possibility to acidify the milk
  - Better hygiene





# Recent fattening trial with essential oils

## Average growth S92



**Growth (g/day):**

**A: 220**

**B: 216**

**Feed intake(kg):**

**A: 7.4**

**B: 7.8**

**FCR :**

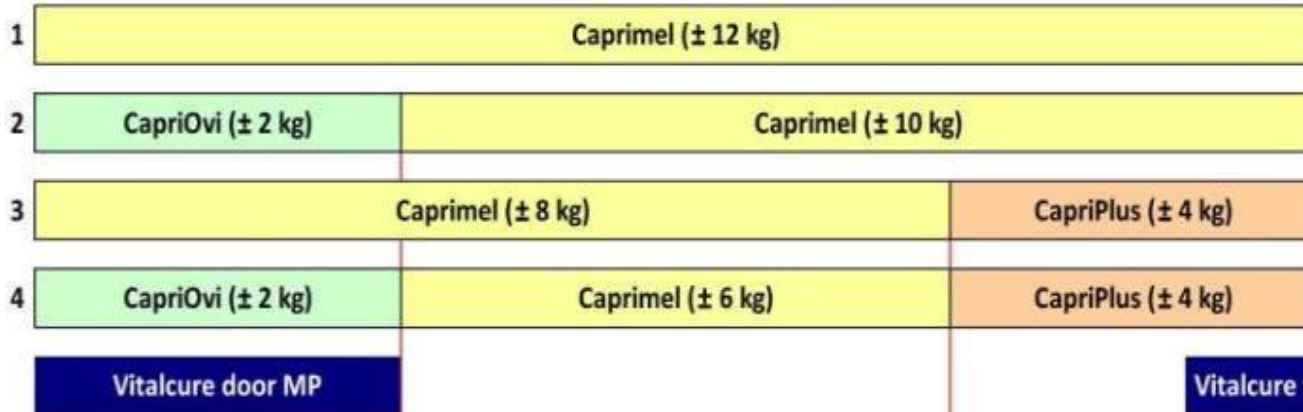
**A: 1.19**

**B: 1.29**

2 x180 kids

# Denkavit Capri Concept

## Spenen 7e week



	cp / cf
Caprimel	23/19
Capriplus	22/18
CapriOvi	24/21.5

## Verlengde opfok



# Application

## Concentration

- 175-200 gr / litre of water
- For fattening 200-240 g/l water

## Ad libitum feeding at the lamb bar: CapriOvi

- Prepare and apply at room temperature
- Refresh several times daily

## Restricted feeding: Caprimel / CapriPlus / CapriOvi

- Dissolve in water of 45 - 50 °C
- Drinking temperature 41 – 42 °C

## Automatic feeder: Caprimel / CapriPlus / CapriOvi

- Set preparation temperature at 43 – 44 °C





# Portfolio (NL)

## Caprimel

- Around milk replacer for rearing purposes
- Highly palatable, highly digestible
- Excellent and safe juvenile growth
- Crude protein 23 %, crude fat 19 %
- Suitable for automatic feeders

## CapriPlus

- Attractive alternative with lower energy level
- Perfect for final weeks before weaning
- High intake of concentrates, easy weaning
- Excellent digestibility
- Crude protein 22 %, crude fat 18 %
- Suitable for automatic feeders



# Portfolio (NL)

## CapriOvi

- High energy content for the first 10 - 14 days
- Also suitable for fattening of male goat kids
- 1<sup>st</sup> phase rearing
- Highly stable in solution
- High degree of safety
- Universally applicable
- Crude protein 21.5 %, crude fat 24 %

## Caprifit

- Attractive alternative
- High energy content
- Fattening of male goat kids
- 1<sup>st</sup> phase rearing



# Portfolio (NL)

## CapriOvi Royal

- With 50 % skimmed milk powder
- High energy content
- Also suitable for fattening of male goat kids
- Highly stable in solution
- High degree of safety
- Universally applicable
- Crude protein 22 %, crude fat 25 %





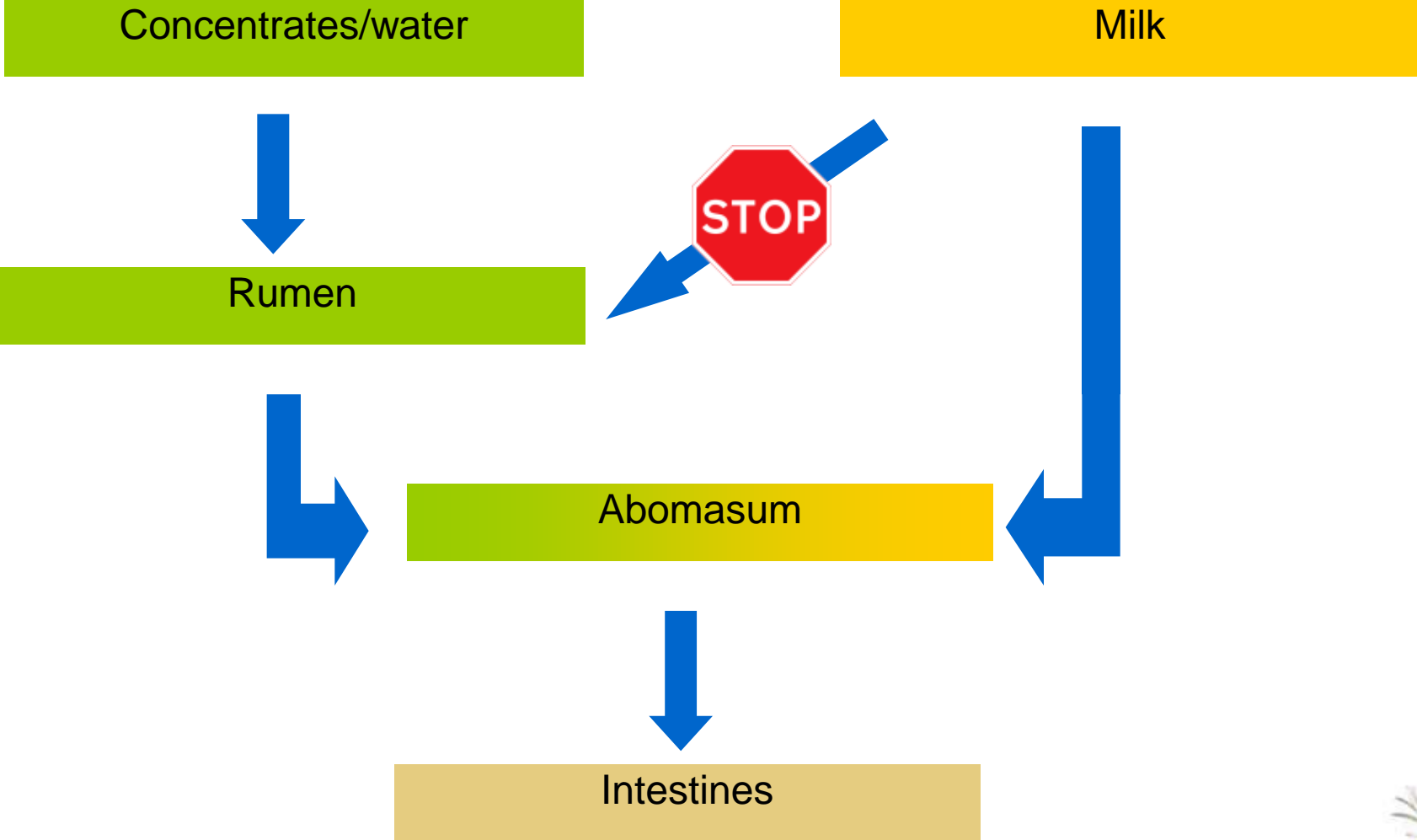
# Features of goat kids



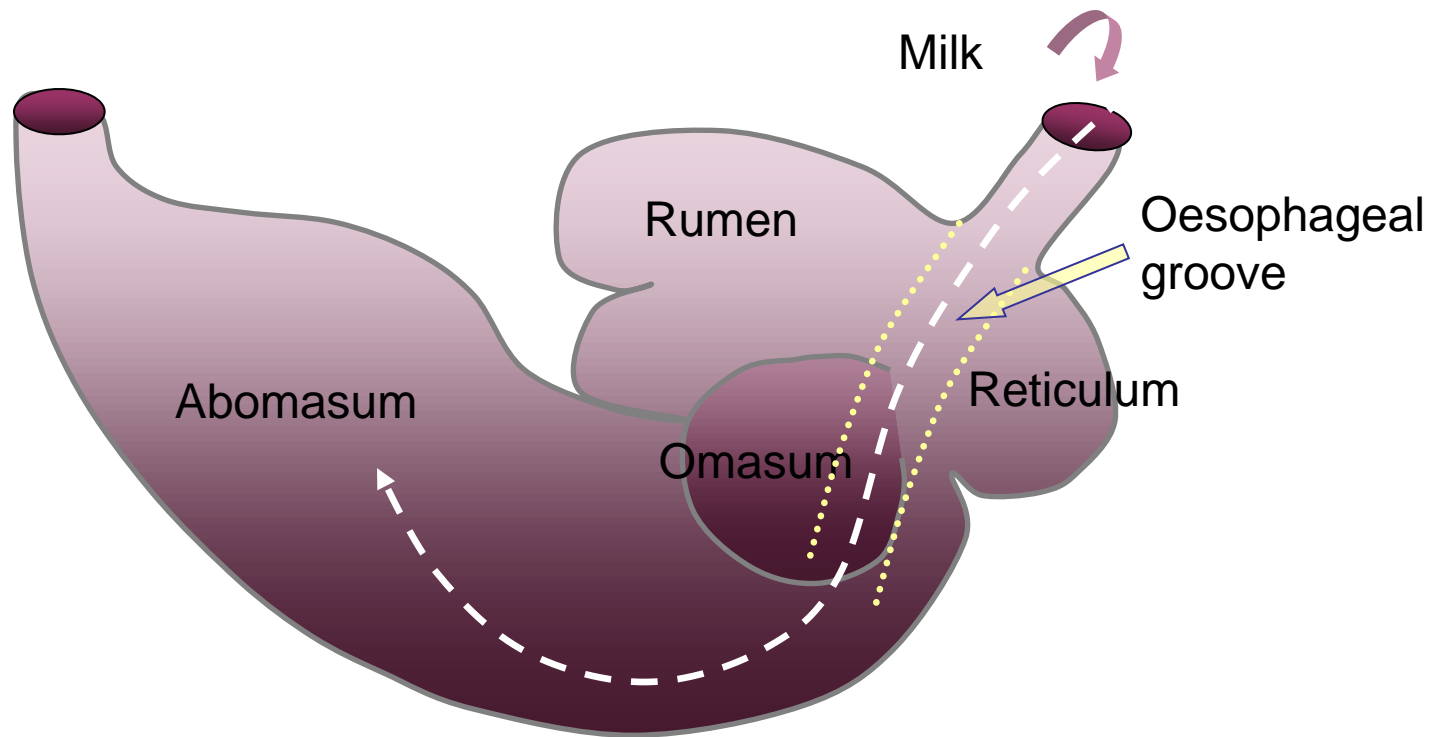
Oesophageal groove  
reflex



# Flow of feed in the animal



# Oesophageal groove reflex





# Causes of rumen drinking

- Lumps in the milk
- Excessive milk intake
- Variation in concentration
- Teat height < 15 cm
- Damaged teats (sucking air)
- Tube feeding
- Variable drinking temperature, too low temperature in no-teat feeding systems
- Composition of milk replacer
- Stress (e.g. transport / competition)
- Poor health (e.g. respiratory disease)



# Features of goat kids



Development of rumen and abomasum

Ruminant

Feed and water intake

# Rumen development



# Rumen development



- Small quantities
- Easily digestible
- Always (!) fresh



- 10 % chopped hay, straw or alfalfa
- Dry
- Tasty
- Hay: chopped





# Difference in rumen development in 7 weeks



# Weaning

Supply as from day 7:

- Unlimited fresh and palatable water
- Highly digestible and palatable goat kid pellet
- Chopped alfalfa/ hay / straw

Weaning without growth check:

- Minimum 6 weeks of age
- Body weight 12 tot 14 kg
- Consumption of pellet 250 gr/day



# Setup of weaning method trial

- Methods:
  - Influencing ease of drinking via mounted taps
  - Application of cold milk (room temperature)
  - Decreasing concentration by 50 % (down to 95 g/l water)
  - Once a day supply of milk



## Results weaning method trial

	Control	Influencing drinking ease	½ concentration	Cold milk	Milk 1 x daily
<b>ADG</b>					
<b>0-56 days (gram)</b>	<b>179</b>	<b>226</b>	<b>166</b>	<b>174</b>	<b>201</b>
<b>Weight gain (kg)</b>					
<b>Weight gain (kg)</b>	<b>10.02</b>	<b>12.47</b>	<b>9.27</b>	<b>9.78</b>	<b>11.28</b>
<b>Difference (index)</b>	<b>100</b>	<b>126</b>	<b>93</b>	<b>97</b>	<b>112</b>





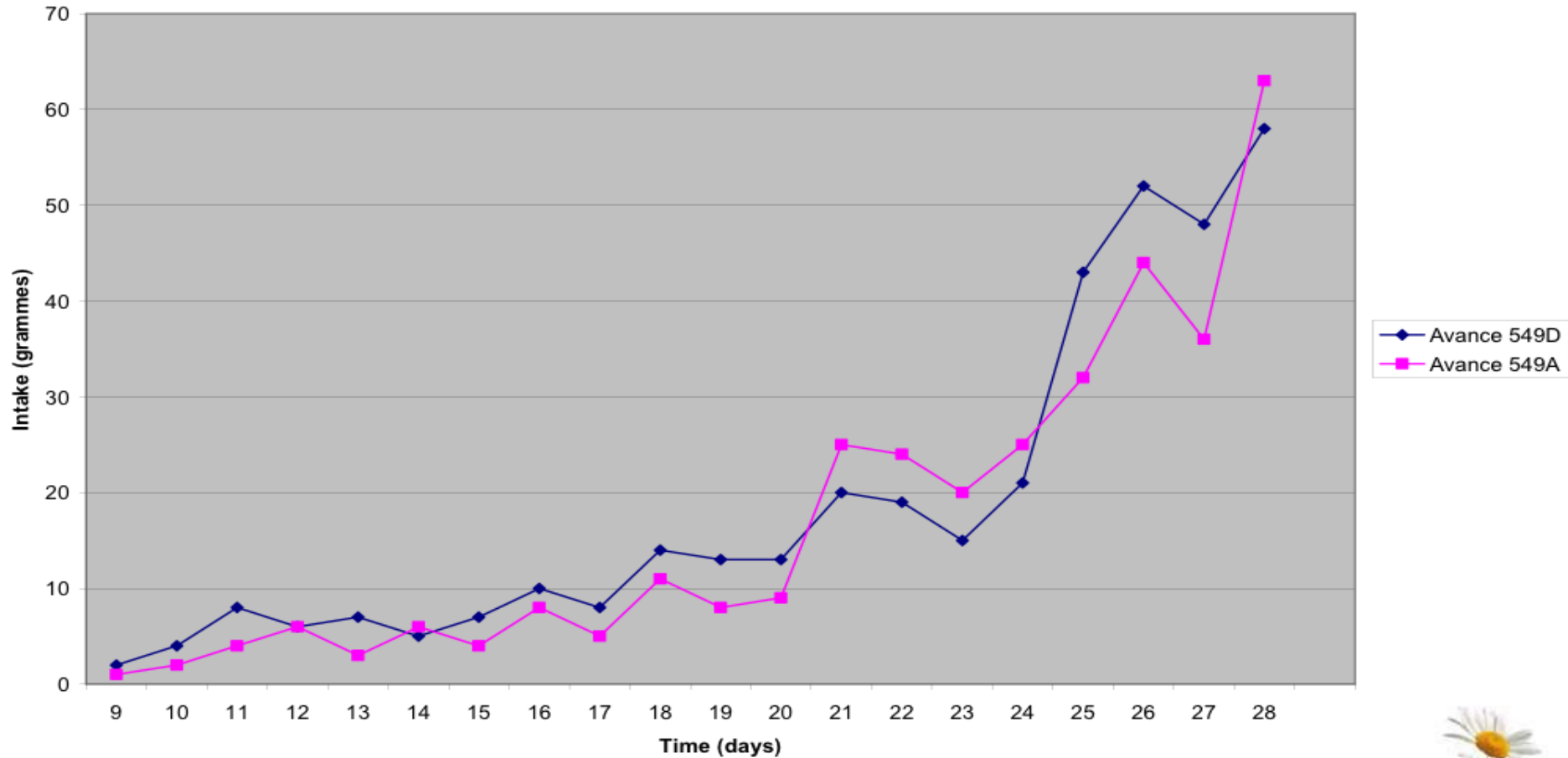
## Results weaning method trial



	Control	Influencing drinking ease	½ concentration	Cold milk	Milk 1 x daily
<b>Intake of concentrates (gram)</b>					
7-28 days (gram)	17	17	17	17	17
28-35 days (gram)	70	102	70	70	70
35-42 days(gram)	107	124	107	107	110
42-49 days(gram)	191	324	257	203	318
49-56 days (gram)	484	536	467	480	562
<b>0-56 days (gram)</b>	<b>129</b>	<b>163</b>	<b>136</b>	<b>130</b>	<b>158</b>
<b>Total (gram)</b>	<b>6312</b>	<b>7968</b>	<b>6662</b>	<b>6371</b>	<b>7752</b>
<b>Difference (index)</b>					
<b>Difference (index)</b>	<b>100</b>	<b>126</b>	<b>106</b>	<b>101</b>	<b>123</b>

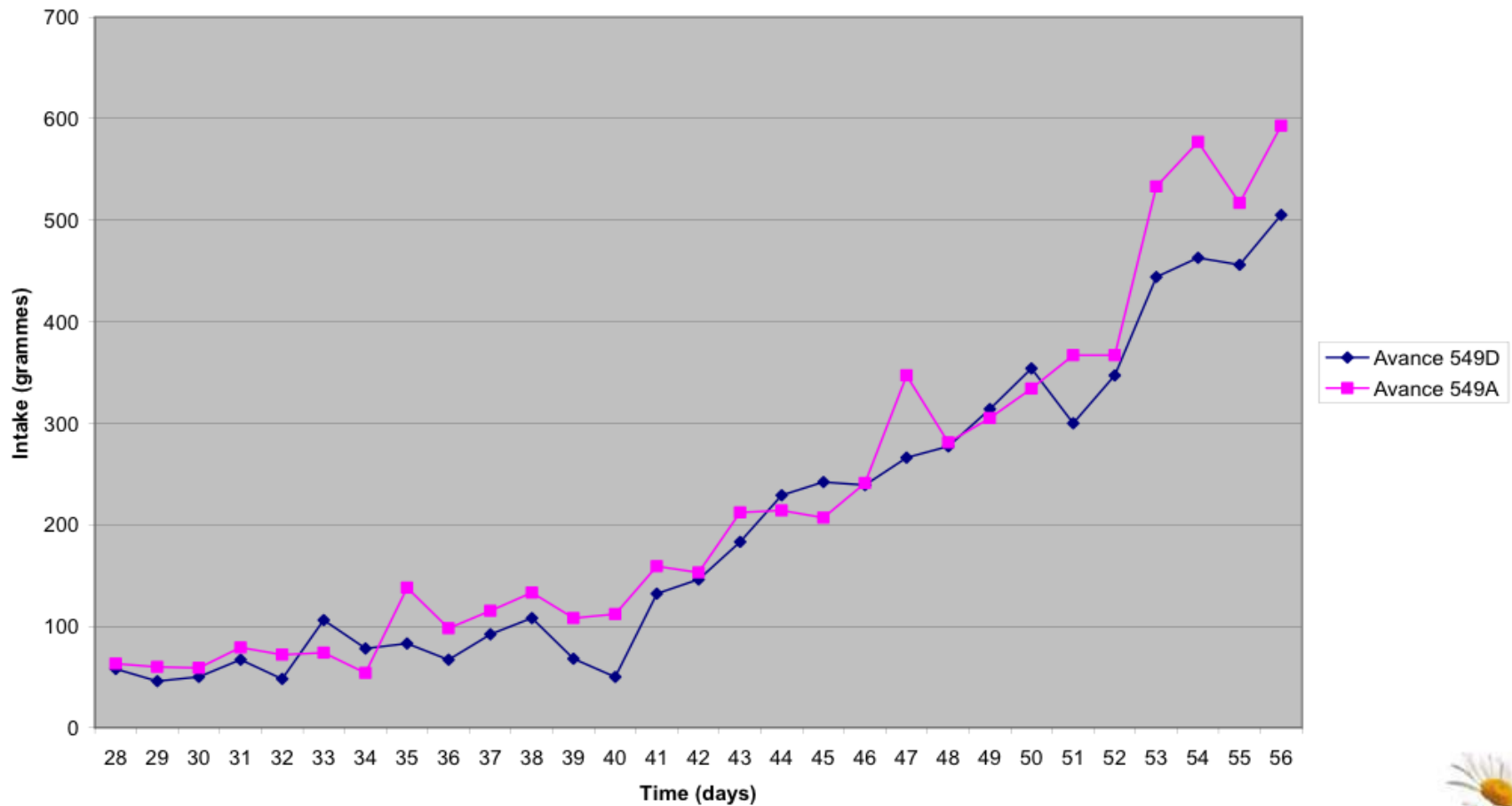
# Development of concentrate intake 0-28 days

Intake of kid starter day 8-28



# Development of concentrate intake 28-56 days

Intake of kid starter day 28-56



# Supply of drinking water

**Water = key nutrition**

**FRESHLY available AT ALL TIMES**

- Number of drinking reservoirs
  - 3-4 drinking reservoirs / 100 goat kids
- Location
  - Close to concentrates and roughage
  - Away (far) from teats
- Type of water reservoir
- Water quality
  - Municipality / own water source (well)







# Application of milk replacer: an art



G R O E I E N   D O E   J E   S A M E N



# Application of milk replacer. Attention points:

- Concentration
- Mixing temperature
- Mixing time
- Drinking temperature
- Water quality
- Hygiene



# Feeding systems



Automatic feeder



Restricted feeding



Ad lib stockfeeding





# Restricted feeding (trough)





# Restricted feeding (lamb bar)

- Mount a sufficient number of teats
- Do not overfeed
- Feed according to schedule



# Ad lib stockfeeding (lamb bar)

- Always milk available
- Always at constant temperature
- Milk replacer 24 hour stability
- Milk replacer soluble in warm or cold water
- Verify milk intake
- Hygiene



# Automatic feeder



# Pitfalls automatic feeder

- Infection pressure at the automatic feeder
- Incorrect installation and settings
  - Setting concentration / calibration
  - Cleaning of powder orifice
  - Mixing temperature (43 / 44 °C)
- Hygiene of teats, tubes, mixing cup
- Stress of goat kids in group
  - Correct training
  - Group size
- Difficult setup regarding general treatment

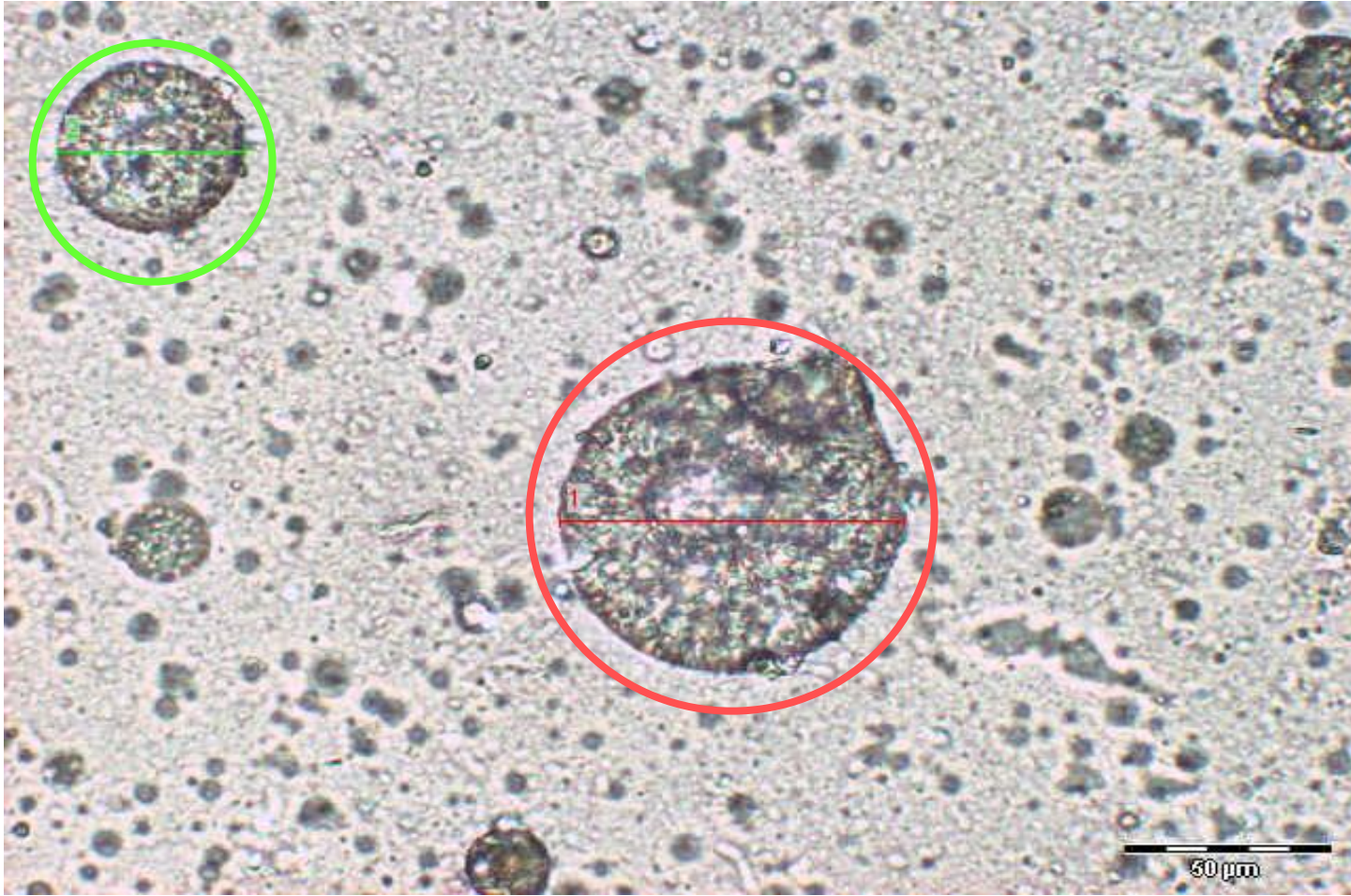




# Avoid too large group size



# Improper preparation, T has to be > 40 degrees



1 = 83.2 μm  
2 = 45.4 μm

Watery solution  
x 200

Many badly dissolved fat particles





# Too high mixing temperature

> 65°C

Frequently encountered in case of 2-step preparation/mixing

Effect:

- Denaturation of protein:
  - Less soluble
  - Less digestible/undigestible
- Loss of vitamin activity (breakdown)
- Negative impact on fat emulsification



**Consequence: poor growth and digestive disorders !**



# Group housing

Focus : High growth and rumen development

## Group size

- Not too big (heterogeneity)

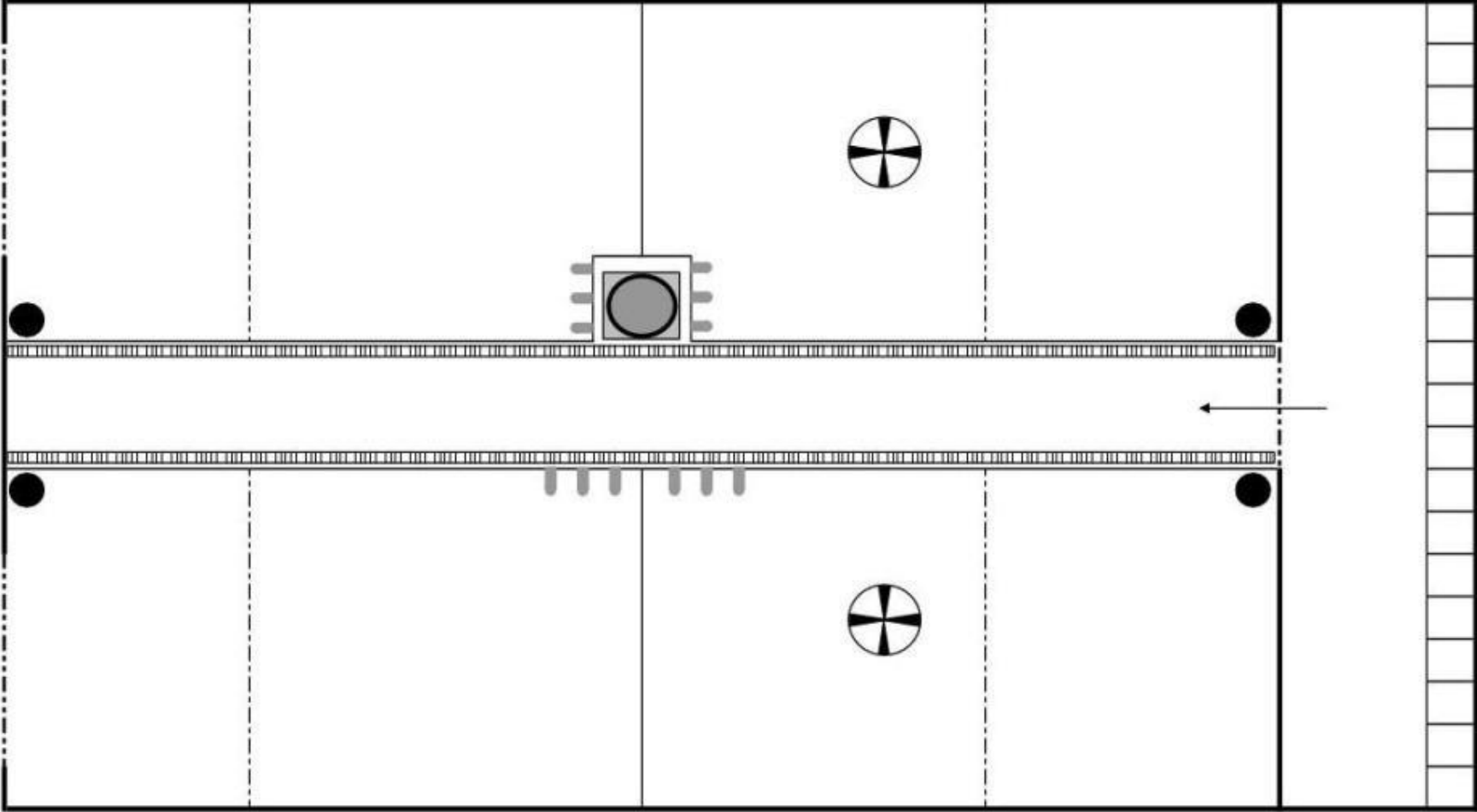
## Pen surface for each goat kid

- More space for moving around
- Lower infection pressure
- Less stress
  
- Water
- Supply of concentrates and roughage
- Freshness of feed(s)
- Automatic feeder

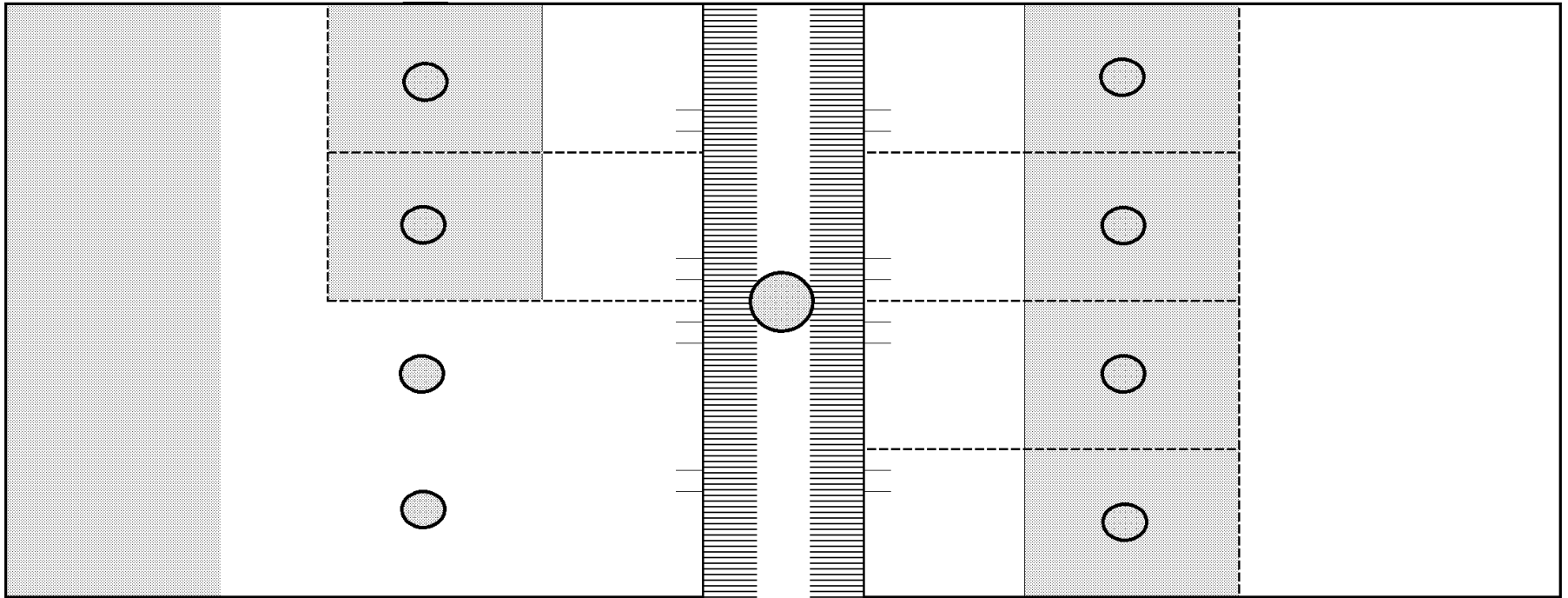




# Example of setup



# The ideal rearing unit ?



# Why the attention to climate ?

Climate has serious impact on:

- Respiratory disease (2x)
- Medical treatment
- Development and capacity of the respiratory system
- Feed intake and growth
- Uniformity
- Infection pressure
- Future results !!!



# Successful rearing

- Colostrum
  - 1st day
  - Correct quantity/type applied by teat
- Training pen
  - Max. 10 - 15 goat kids per teat
  - Min. 2 teats at 35 - 40 cm height
  - Close to the automatic feeder
  - Vertical teat opening (optimum milk yield)
- Milk intake
  - Check 2 times per day
- Regular checks
  - Replace damaged teats
  - Clean orifice daily
  - Check concentration once a week
- Weighing
  - Determine correct moment of weaning





Thanks for your attention!

