Investigation of early feed intake: does suckling rabbit have pellet preferences?


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Context of the study

High incidence of digestive disorders around weaning

**Hypothesis**: Early feeding could guide microbiota implantation process, thus improve rabbit health
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High incidence of digestive disorders around weaning

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**Objectives**:
(1) Gain more knowledge on early feeding ability
(2) Determine how to stimulate pups solid feed intake with attractive pellet presentation
Material and methods: animal husbandry

Milking control

3  18
Material and methods: animal husbandry

Milking control

3 15 18 35 : weaning

: feed in the nest
(daily measurements from d8)
: feed outside the nest

2 kinds of pellets available
Material and methods: animal husbandry

Milking control

3 15 18 35: weaning

: feed in the nest
(daily measurements from d8)

: feed outside the nest

: classical fattening

2 kinds of pellets available
Dynamic of suckling rabbit early feed intake

From 8d to 17d, total consumption of 2.5 g of DM/rabbit and total dry feed consumption = 0.6% of total fresh milk consumption
Dynamic of suckling rabbit early feed intake

From 8d to 17d, total consumption of **2.5 g of DM/rabbit** and total dry feed consumption = 0.6% of total fresh milk consumption
Dynamic of suckling rabbit early feed intake: investigation of inter-litter variability

Trial 2.

Which variables affect feed consumption from 7 to 20 days-old?

<table>
<thead>
<tr>
<th>Effects</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>***</td>
</tr>
<tr>
<td>Feed treatment</td>
<td>NS</td>
</tr>
<tr>
<td>Litter weight at 3 d</td>
<td>***</td>
</tr>
<tr>
<td>Milk consumption</td>
<td>NS</td>
</tr>
<tr>
<td>Nest quality</td>
<td>NS</td>
</tr>
</tbody>
</table>

R2 = 0.40 (p=0.05)
Material and methods: experimental feed

Trial 1.  

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>diam (mm)</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

Tested in pairs  

\[ \Rightarrow 6 \text{ treatments (} n=60 \text{ litters) } \]
Did pellet diameter affect suckling rabbit consumption?

**Trial 1.** Example treatment AB:

\[
\text{relative consumption pellet } A = \frac{\text{Quantity } A}{\text{Quantity } A + \text{Quantity } B} \times 100
\]

**Nest**

![Bar chart showing relative feed consumption (%) for different treatments AB, AC, AD, BC, BD, CD. The chart includes error bars and a comparison symbol indicating a significant difference.](image)
Did pellet diameter affect suckling rabbit consumption?

**Trial 1.** Example treatment AB:

Relative consumption pellet A = \[ \frac{\text{Quantity } A}{\text{Quantity } A + \text{Quantity } B} \times 100 \]

**Nest**

**Feeders**

Did pellet diameter affect suckling rabbit consumption?

\[ P < 0.1 \]
Relationship between feed preference and physical pellets characteristics

Trial 1.

- No clear preferences for a specific pellet in the nest
- Outside nest: pellet A is attractive / aversion for pellet D

How to explain these preferences?

<table>
<thead>
<tr>
<th>Feed</th>
<th>Diameter (mm)</th>
<th>Hardness (MPa)</th>
<th>Durability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pellet A</td>
<td>2.0</td>
<td>1.2 ^ab^</td>
<td>95 ^a^</td>
</tr>
<tr>
<td>Pellet B</td>
<td>3.0</td>
<td>1.4 ^b^</td>
<td>95 ^a^</td>
</tr>
<tr>
<td>Pellet C</td>
<td>4.0</td>
<td>1.4 ^b^</td>
<td>92 ^a^</td>
</tr>
<tr>
<td>Pellet D</td>
<td>6.0</td>
<td>1.1 ^a^</td>
<td>86 ^b^</td>
</tr>
</tbody>
</table>

Small diameter might explain preferences for A over B and C
Large diameter and low durability might explain low palatability of D
Material and methods: experimental feed

**Trial 1.**
- Diam (mm): 2, 3, 4, 6
- Tested in pairs → 6 treatments (n=60 litters)

**Trial 2.**
- Different compression rates (= die channel length / die diameter)
  - Ø 2,5 mm
    - Ø 2.5 mm: 4, 4.8, 5.6
  - Ø 4 mm: 4.6, 5, 6
- Tested in pairs

→ 6 treatments (n=63 litters)

✓ Pellet physical and chemical properties controlled
Did compression rates affect suckling rabbit consumption?

**Trial 2.**

\( \phi \ 2.5 \text{ mm} \): no compression rate effect

\( \phi \ 4 \text{ mm} \)

**Nest**

**Feeders**

![Bar graphs showing relative consumption percentages for different treatments (CH, CI, HI) under varying nest and feeder conditions.]
✓ First success to stimulate and evaluate kits consumption from 8d with pellets

✓ Better knowledge of early feeding consumption:
  • Low quantities compared to milk (0.1 - 2%)
  • Variability in the feeding onset and in the amount consumed
  • Significant effect of the initial litter weight
  • Pellet diameter can modify palatability outside of the nest → small diameter pellet may be of interest
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Prospects:
Analysis of early dietary intervention on growth performance, microbiome composition and rabbit health
Thanks for your attention!

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Material and methods: animal husbandry (2)

Between 15d and 18d:

- Doe
- Doe feeder
- Nest
- Kits
- Kits feeder
- Pellet 1
- Pellet 2
**Nest**

Data in number of pellets

Data in grams
Feeders

Data in number of pellets

Data in grams