Passive transfer of dam immunoglobulins to calf in two beef breeds undernourished in early pregnancy


1CITA de Aragón - IA2, Zaragoza, Spain. 2Universitat de Lleida (UdL), Lleida, Spain.

*anoya@cita-aragon.es
Subnutrition during gestation

Gestation

1st third 2nd third 3rd third

- Foetal programming
- Embryo cell differentiation
- Tissue composition

- Mammary gland
- Colostrum yield

Maternal subnutrition

- Delayed the newborn haematopoietic system development
- Diminished the ADG in Pirenaica calves during the lactation period
- Decreased interferon tau stimulated gen expression in Pirenaica pregnant dams
Dam blood

Mammary gland

Colostrum

Calf blood

Ig’s transference

Before parturition

After parturition

24 – 36h after birth

Bovine syndesmochorial placenta
Objective

Undernutrition 1st third gestation

Dam
Ig G – Ig M

Colostrum
Ig G – Ig M

Calves
Ig G – Ig M

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Methodology

\[ \text{Feeding treatment} \]

<table>
<thead>
<tr>
<th>Breeding</th>
<th>Control (C)</th>
<th>Subnutrition (S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parda de Montaña (PM)</td>
<td>PM C</td>
<td>PM S</td>
</tr>
<tr>
<td>Pirenaica (PI)</td>
<td>PI C</td>
<td>PI S</td>
</tr>
</tbody>
</table>

2 x 2 design

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Bovine Ig G and Ig M ELISA Quantitation Set

Plasma
- Ig G: 1:300,000
- Ig M: 1:20,000

Colostrum
- Ig G: 1:500,000
- Ig M: 1:50,000

Results
Results

\[ \text{Ig G concentration (mg/ml)} \]

- d 253 of gestation
- Dam plasma
- Parturition
- Dam plasma
- 0-12h post parturition
- Colostrum
- 12-24h post parturition
- Colostrum
- 48h after birth
- Calf plasma

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Results

Ig G concentration (mg/ml)

0 10 20 30 40 50 60 70 80 90 100

d 253 of gestation Dam plasma Parturition Dam plasma 0-12h post parturition Colostrum 12-24h post parturition Colostrum

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**Results**

Ig G concentration (mg/ml)

- d 253 of gestation Dam plasma
- Parturition Dam plasma
- 0-12h post parturition Colostrum
- 12-24h post parturition Colostrum
- 48h after birth Calf plasma

$r = 0.30, p = 0.036$

$r = 0.35, p = 0.014$
Results

Ig M concentration (mg/ml)

- Dam plasma
- Parturition
- Colosrum
- 0-12h post parturition
- 12-24h post parturition
- 48h after birth
- Calf plasma
Results

![Graph showing Ig M concentration over different stages of gestation and postpartum.]

**Results**

![Graph showing Ig M concentration over different stages of gestation and postpartum.]

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**Results**

$r = 0.43, p = 0.0023$

**Conclusions**

Dam plasma immunoglobulins were transferred into the colostrum, diminishing Ig G plasma concentrations from the 8th month of gestation to parturition.

Colostrum samples presented a significant reduction in Ig G and Ig M concentrations over time, highlighting the importance of ensuring the calf colostrum intake during the first hours after birth.

No breed or nutritional effects were observed in calf Ig concentrations, which were related with dam plasma and colostrum Ig concentration.

A breed-nutritional treatment effect could be observed in PI-Control, due to a lack of decrease in dam Ig G plasmatic concentrations and higher concentrations in 2nd colostrum sample.
Thank you for your attention