EFFECT OF DIET SUPPLEMENTED n-3 FATTY ACID ON GOAT MILK COMPOSITION AND SOMATIC CELL COUNT

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Introduction

Small ruminant mastitis is generally a chronic and contagious infection. Somatic cell count (SCC) represents a valuable tool for its assessment. Prevention is mostly based on sanitation control and milking technique optimization.

Exist some diet effect on prevention?

It has been proven that n-3 unsaturated fatty acids can reduce the severity of inflammatory injury by altering the availability of arachidonic acid in tissue phospholipids (by human) (reported by Connor W.E. et al. 2000) (reported by Gadek J.E 1999) and few other research studies.

Exist some diet effect on prevention?

Palombo J.D. et al. 1999. (Effect of short-term enteral feeding with eicosapentaenoic and γ-linoleic acid on alveolar macrophage eicosanoid synthesis and bactericidal function in rats)

MEASUREMENTS AND MILK SAMPLES

Experimental
The study was conducted on an Alpine farm on 62 Alpine breed goats 51 kg (±6 kg) body weight, 4 to 20 weeks following parturition. The goats were machine-milked twice daily, at 6 a.m. and at 6 p.m.

Adaptation period 10 days:
day 10 animals were randomly computer allocated into 4 groups:
Group 1 - EPA: (15 animals) supplement of EPA (Pronova Biocare, Norway) - 5 days 20 g/day
Group 2 - ALA: (15 animals) supplement of ALA (A.C.E.F. Lex) - 5 days 20 g/day
Group 3 - DHA: (15 animals) supplement of DHA (Nippon Chemical Feed Co) 5 days 20 g/day
Group 4 - CONTROL: (17 animals) no supplement.

n-3 unsaturated fatty acids were supplemented through a tube which was introduced into esophagus every morning milking during five days.

MEASUREMENTS AND MILK SAMPLES

Goats were milked twice daily; Milk yield was measured by each milking
Two samples -70 ml and 3ml of milk were taken
Day 1 to day 10 adaptation period
Day 11-15 n-3 (ALA, EPA, DHA supplemented (5 days of its supplementation)
5 days after supplementation each milking were measured and samples were taken
Further each 5 day until day 70 were measured by each milking.
Measurement each 5 day

EXPERIMENT PERIOD day 1 to day 70

<table>
<thead>
<tr>
<th>Period 1</th>
<th>Period 2</th>
<th>Period 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapt.</td>
<td>n-3</td>
<td>Day 16 to day 20 contin. and after day 21 to day 70</td>
</tr>
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</table>

Value of SCC in different group

<table>
<thead>
<tr>
<th>Group</th>
<th>EPA</th>
<th>ALFA</th>
<th>DHA</th>
<th>CONT</th>
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</thead>
<tbody>
<tr>
<td>SCC (x10^3) in the adaptation period (Period 1)</td>
<td>1316^a</td>
<td>1095^a</td>
<td>585^b</td>
<td>526^b</td>
</tr>
<tr>
<td>SCC (x10^3) the period of supplementation (Period 2)</td>
<td>1631^a</td>
<td>975^b</td>
<td>1166^a</td>
<td>1258^a</td>
</tr>
<tr>
<td>SCC (x10^3) after supplementation (Period 3)</td>
<td>1531^a</td>
<td>915^b</td>
<td>1884^a</td>
<td>1364^a</td>
</tr>
</tbody>
</table>

Value of SCC in different period

Exist some diet effect on prevention SSC

The experiment of supplementation of ALA of high dose and of short duration in intervals of 30 to 40 days should be carried out to test if this is an appropriate and economic method to reduce SCC in goat milk.

This might also be of special interest for those, who raise goats on pasture, because ALA is the only n-3 unsaturated fatty acid of non-maritime plant origin. It can be found in fresh pasture and seeds and it would be interesting to see the difference in SCC among animals indoor or on pasture fostering.
Exist some diet effect on prevention?

- No effect on microorganisms
- No effect on milk yield
- Low effect on milk composition (EPA and DHA)
- Effect on SSC - decreasing 40 days after supplementation (ALA)

(Some more research are needed?)

Thank you