INTRODUCTION

Iodine deficiency occurs with a high frequency in Europe, as much in humans as in cattle. Pathologies related to this deficiency are common and largely concern newborns. Nowadays, numerous mineral factories increase I content in their mineral-vitamin premix to prevent I deficiency. But the diagnosis of I deficiency must be previously made. The aim of this study is to compare biochemical tools to assess I deficiency in the newborn calf.

MATERIAL & METHODS

- Animals & groups
  - 12 healthy pregnant Holstein cows (>3 y) in 2 groups of 6: NS (non-supplemented with I) and S (suppl. with I at least 2 months before calving)
  - All cows deficient at the beginning (based on Plasma Inorganic Iodine -PII- <40 µg/L)
- Nutrition
  - Diet composition (10 kg DM): hay, concentrate 18% protein, flat barley, dried beet pulp ⇒ 5 mg I + 1 mg Se/cow/day
  - Iodine supplement : iodinated salt containing I (Ca-iodate) and Se (Na-selenite) ⇒ 50 mg I + 3 mg Se/cow/day
- Samples & Dosages, at birth before colostrum and 15 days later for calves and at calving for dams
  - Plasma (heparin) and Serum : dams & calves
  - Colostrum, Milk, Amniotic and Allantoic fluids : dams

RESULTS

I in calves & dams (µg/L)

Legend (Statistics)

Statistic tests : t-student test, paired and unpaired
(*) Comparison NS >> S, significantly different (p<0.05)
(#) Comparison T0 >> T15, significantly different (p<0.05)
(+) Comparison amnios >> allantoid : significantly different (p<0.05)
(*) Comparison colostrum >> milk : significantly different (p<0.05)

DISCUSSION

Iodine supplementation increased PII in both dams and calves. I content of colostrum, milk, allantoic and amniotic fluids is affected in the same way by the supplementation. Iodine levels in the different physiological fluids reflect therefore recent I supplies. Calves PII was more correlated with I in fetall fluids than PII in the dam. This might indicate the placental transfer of I from dam to calf. If I levels could clearly discriminate the groups, thyroid hormones T4 (at T0), T3 and r-T3 didn't show any difference between groups. Nevertheless, 0.5 ppm I (diet) is just sufficient for the synthesis of thyroid hormones. However, bTSH discriminated the 2 groups of newborn calves. Further studies are needed to fix normal values of bTSH in dams and calves.

Recommended literature

Miller et al. J. Dairy Sci., 1975, 58: 1578-1593