

Fetal profiles of bovine placental lactogen (PL) and insulin like growth factors (IGF-I and IGF-II) through the late gestation.



Andrea Vivian Alvarez-Oxiley, Noelita Melo de Sousa, José Sulon and Jean-François Beckers
Physiology of Animal Reproduction, Faculty of Veterinary Medicine, University of Liège, Belgium.

Aim

The temporal and spatial distribution of bovine placental lactogen (bPL), insulin-like growth factors I (IGF-I) and II (IGF-II) was studied in cattle during intrauterine development.

Introduction

Regulation of fetal growth is a complex process influenced by genetic factors and modulated by hormones and growth factors.

Methods

Sera were collected at slaughterhouse from 71 fetuses (120 to 274 days gestation).

Serum IGF-I concentration was determined by radioimmunoassay according to the method described by Renaville *et al.* (1993).

The IGF-II was measured by RIA system that used recombinant human IGF-II (GroPep Pty. Ltd., Adelaide, Australia). The reactivity of bovine IGF-II in this system was higher than 85%.

Radioimmunoassay of bPL was performed according to the method of Beckers *et al.* (1982) with slight modifications. Recombinant bPL (rbPL; NHPP, Dr. Parlow) was used as standard and tracer.

Results

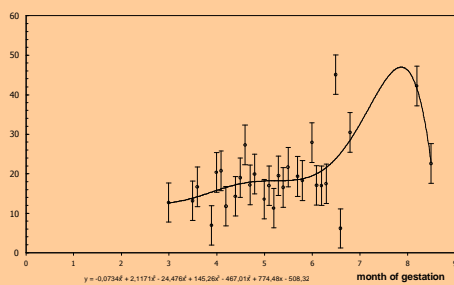
Serum concentration of IGF-I and IGF-II increased ($P < 0.05$) with advancing gestational age, whereas serum bPL declined ($P < 0.05$) linearly ($P < 0.01$) throughout gestation.

Our results also showed that IGF-II levels in bovine fetal serum were 30 to 40 fold higher than IGF-I, following a pattern very similar to that of IGF-I.

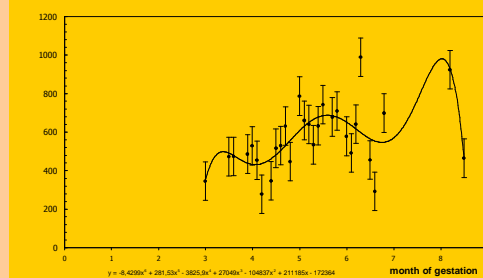
Both IGF-I and IGF-II concentrations gradually increased from Day 120 to 240 of gestation and then declined slightly through Day 274.

Concentrations of bPL in fetal bovine serum ranged from 5 to 35 ng/ml.

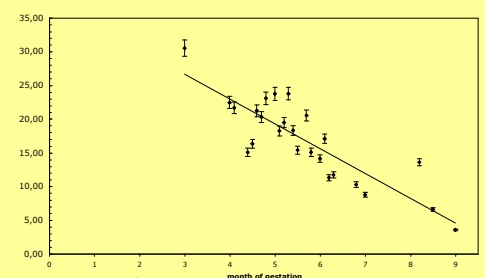
Fetal IGF-I



Fetal IGF-II



Fetal bPL (ng/ml)



Discussion and Conclusion

In conclusion, during the last two-thirds of pregnancy IGF-I and IGF-II gradually increase, this coincide with fetal growth rates measured in bovine species (Holland *et al.*, 1997) suggesting that these molecules are involved in the fetal development. In the current study, fetal bPL showed a distinct temporal pattern from those of IGF-I and -II. These finding may help to understand the relation between placental hormones, growth factors and intrauterine growth.

References:

- Beckers JF, De Coster R, Wouters-Ballman P, Fromont-Lienard C, Van der Zwalmen P, Ectors F. *Ann Med Vet* 1982;126:9-21.
- Renaville R, Devolder A, Massart S, Sneyers M, Burny A, Portetelle D. *J Reprod Fertil* 1993;99(2):443-9.
- Holland MD, Hossner KL, Williams SE, Wallace CR, Niswender GD, Odde KG. *Domest Anim Endocrinol* 1997;14:231-239.

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