

Gastrointestinal absorption of insulin in suckling pigs

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A high level of insulin has been detected in porcine milk and the concentration is about 100-fold greater than the blood concentration in sows. The objective of this study was to determine if milk-borne insulin can be absorbed in suckling pigs.

Five newborn piglets naturally suckled for three hours and five 3-day-old naturally suckled piglets of Lancrace and Large White crossb(FITC-insulin) per kg body weight via an orogastric tube in 10 mL colostrum. Blood samples were taken at 0, 1, 2, 3 h following the delivery of FITC-insulin for determining blood glucose and FITC-insulin concentration. Intact FITC-insulin in the plasma samples was identified by exclusion chromatography (Sephadex G-25).

Blood glucose concentration decreased 2h after oral administration of FITC-insulin in both newborn and 3 day old pigs. Plasma fluorescent activity rose steadily following oral administration of FITC-insulin (Figure). Chromatographic analysis revealed that about 60% of the fluorescent activity corresponded to intact FITC-insulin in both groups.

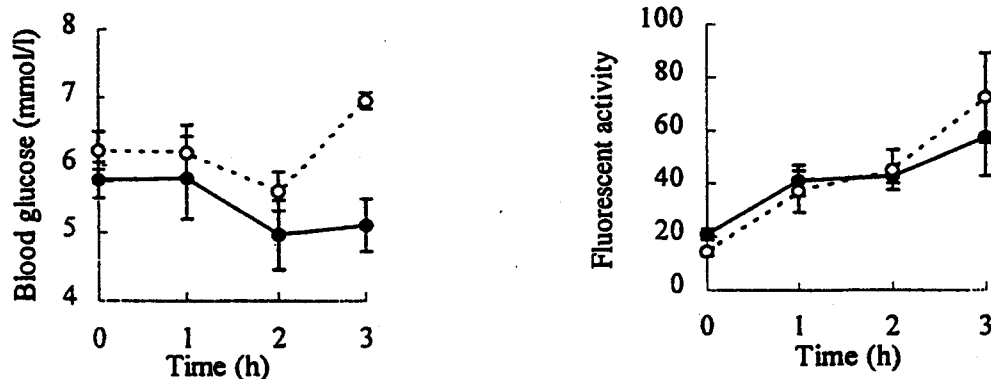


Figure. Blood glucose and fluorescent activity in newborn (●) and 3 day old (○) piglets following oral-gastric administration of FITC-insulin.

The results show that milk-borne insulin can be absorbed in both newborn and 3 day old piglets. The study supports and extends our previous findings that orally administered insulin-like growth factor-I can be absorbed in suckling pigs and the absorption is independent of gut closure (1). Such findings suggest that milk-borne insulin and insulin-like growth factors may play a physiological role in regulating postnatal development in the suckling young.

1. Xu RJ, Wang T. Gastrointestinal absorption of insulin-like growth factor I in neonatal pigs. *J Pediatr Gastroenterol Nutr* 1996; (in press).