

GALACTOSE AND GLUCOSE CHANGES IN THE BLOOD AFTER INGESTION OF EITHER LACTOSE OR GALACTOSE PLUS GLUCOSE BY PIGLETS WITH DIARRHOEA

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Prewaning losses average 15 to 20% in live born piglets with the greatest losses occurring in the first 72 hours of life and later deaths often a consequence of events in the first hours of life. Hypoglycaemia, diarrhoea (scouring) and crushing are the major causes of death, but exposure to cold is the most important factor in piglet mortality. A limited supply of carbohydrate and poor utilization of available carbohydrate produces a lack of energy and shivering thermogenesis, which results in an inadequate thermal environment (Noblet and Dividich, 1983). The enterocytes of the small intestine in piglets are susceptible to both the cold and enteropathogens, which can cause a loss of mucosal surface area (Lecce, 1986). This may result in carbohydrate malabsorption which could cause diarrhoea and hypoglycaemia. Since diarrhoea is often a symptom of carbohydrate intolerance, this study investigated the functional capacity that piglets with diarrhoea have for lactose digestion and galactose absorption. Furthermore the glycaemic status of these piglets was studied.

Six piglets (2-day-old) with severe diarrhoea were fasted for at least one hour before an oral administration (15 ml) of either lactose (9g/100ml) or galactose plus glucose (4.5g + 4.5g/100ml, respectively). Blood samples (60 μ l) were taken from the ear veins of the piglets at frequent intervals. The plasma (20 μ l) was deproteinised and assayed for galactose and glucose. The same protocol was used to investigate 6 healthy piglets. The change in the concentration of galactose in the blood was plotted against time and the area under the curve (AUC) over the first 60 minutes was calculated (Fig 1). The changes in the concentration of glucose are illustrated in Fig 2.

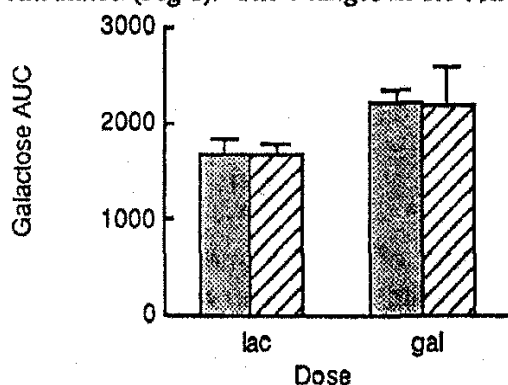


Fig. 1: Mean Plasma Galactose AUC in Healthy (▨) and Scouring (▩) Piglets.

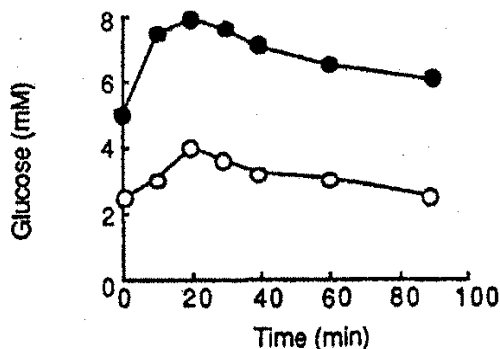


Fig. 2: Plasma Glucose after a Dose of Lactose in Healthy (●) and Scouring (○) Piglets

There was no significant difference in the galactose AUC between those piglets with and without diarrhoea after either the doses of lactose or galactose plus glucose. This suggests that the lactase activity in these piglets with diarrhoea was not affected and that they maintained their capacity to digest milk lactose. Furthermore, the piglets' capacity to absorb galactose was not impaired. The galactose AUC was lower after a dose of lactose compared to that after a dose of galactose plus glucose in piglets with and without diarrhoea. Thus approximately 30% of the lactose passed through to the large intestine. This could result in carbohydrate intolerance and diarrhoea, depending on the type of bacterial flora present in the large intestine. Hence diarrhoea could be a consequence of the metabolic fate of the lactose in the large intestine, which in turn is dependent on the type of flora present. The piglets with the diarrhoea were hypoglycaemic indicating that they were not obtaining enough milk. Hourly doses of galactose plus glucose may be useful in correcting the hypoglycaemia.

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