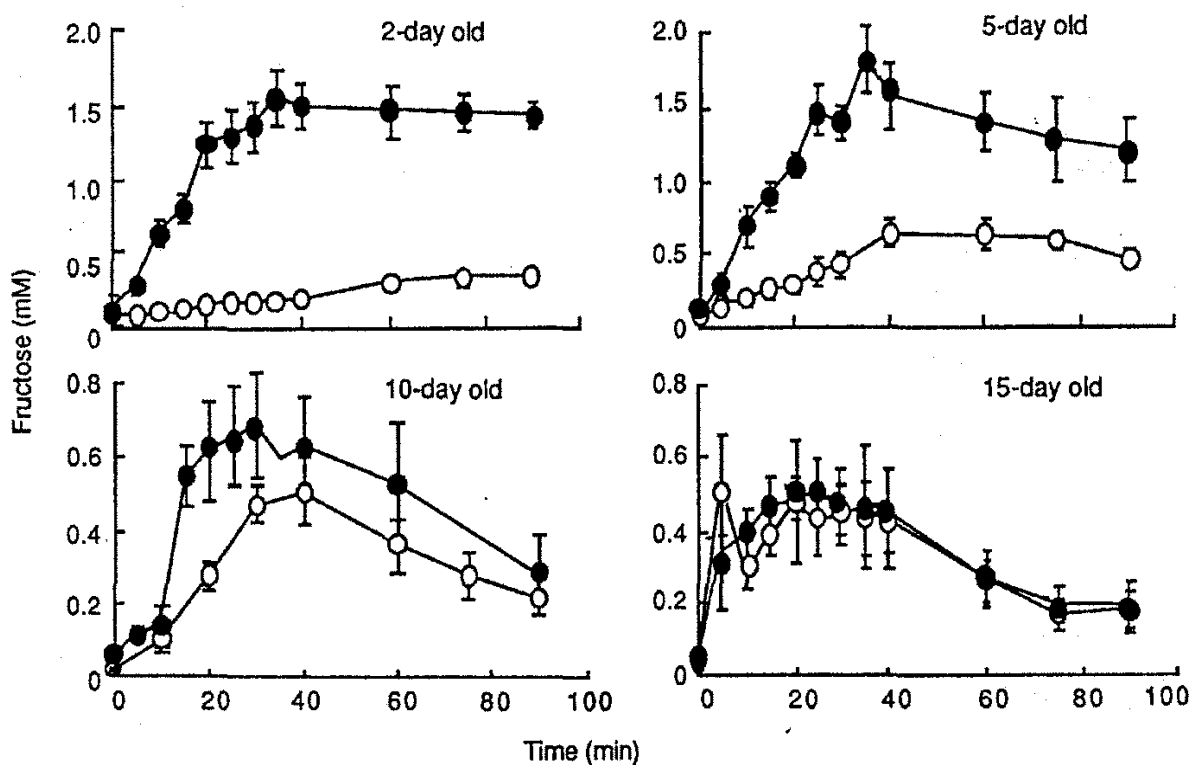


## SUCROSE AND FRUCTOSE AS AN ENERGY SOURCE FOR THE YOUNG PIGLET

P.H. BIRD, S.M. PEMBER and P.E. HARTMANN

Sucrose and fructose can become important nutrients to those suckling piglets fed on creep and at weaning. Several workers have found very little sucrase activity (the enzyme that hydrolyses sucrose to glucose and fructose) in newborn pigs, some at one week and appreciable amounts at two weeks of age. However these studies have been carried out either *in vitro* or with large non-physiological doses of sugars. This study investigated the value of sucrose and fructose as an energy source to suckling piglets using doses that were equivalent to the amount of sugar ingested by a piglet after sucking milk from the sow.

Piglets (2-, 5-, 10- and 15-day-old) were fasted for at least one hour before an oral administration (15 ml) of either sucrose (9g/100ml) or fructose plus glucose (4.5g + 4.5g/100ml, respectively). Blood samples (60  $\mu$ l) were taken from the ear veins of the piglets at 3-5 min intervals for 40 min and then at 60, 75 and 90 min after the dose had been administered. The plasma (20  $\mu$ l) was deproteinised and assayed for fructose. The plasma concentration of each monosaccharide was plotted against time and the results are presented in the figure below as mean  $\pm$  standard error ( $n = 6$ ).



Fructose concentration in the plasma of piglets after a dose of either fructose + glucose (●) or sucrose (○)

The profiles for the plasma concentration of fructose after the doses of either sucrose or fructose plus glucose show that the 2- and 5-day old piglets had a very limited capacity to digest sucrose. Furthermore there was very limited utilization of fructose by these piglets, which is illustrated by the slow clearance of fructose from the peripheral blood. In contrast the 10- and 15-day old piglets did not appear to be limited in their capacity to digest sucrose and there was a more efficient utilization of fructose. Hence sucrose and fructose would be a very poor energy substrate for very young piglets.