

METABOLISM OF LACTIC ACID ISOMERS IN YOUNG PIGS

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Large amounts of D(-) and L(+) lactate (D and L) are produced in the stomach of pigs reared under conventional conditions (Cranwell *et al.* 1968). Each isomer is rapidly absorbed but L is utilised at a faster rate following injection of small quantities of lactate into the duodenum (Christie and Cranwell 1976). It is the purpose of the present study to determine the rate at which both isomers are cleared from the blood following an intravenous injection of large quantities of lactic acid.

Five Large White male pigs aged 8 to 10 weeks had catheters placed in the jugular vein. Each animal received at random each of the following treatments at 5 d intervals: saline (control); pure L, pH 7.1, 5.77 mmol/kg^{0.75}; D in racemic mixture (0.54L : 0.46D), pH 7.0, 5.77 mmol/kg^{0.75}. Blood was sampled at intervals during 300 min after the bolus injection. Plasma was assayed for L (Lundholm *et al.* 1963) and D (Brandt *et al.* 1980).

The clearance of both isomers from the blood (Fig. 1) is described by the equations: $L=5.744e^{-0.043t}$ and for the time periods 10-65 min and 80-170 min, $D=6.944e^{-0.020t}$ and $D=8.635e^{-0.025t}$ respectively.

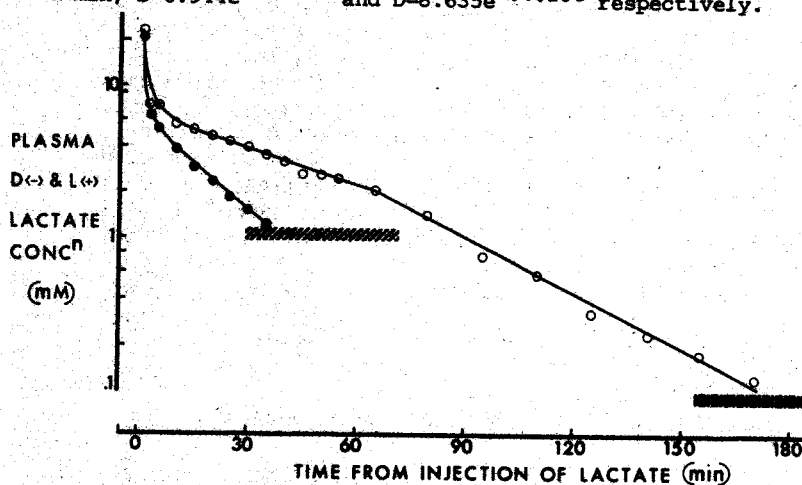


Fig. 1. Mean plasma D(O) and L(●) concentrations following injection of L and racemic lactic acid. Cross-hatched bars denote levels of L and D during saline infusion.

In conclusion 1. L is cleared significantly faster than D. 2. D concentration declined more slowly at high than low levels, suggesting saturation of D-metabolising enzymes. 3. Renal excretion is a most likely means of disposal at high plasma levels.

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