

ABSTRACT

The erythrocytes of malnourished animals bound less insulin than controls (6.4% vs. 17% respectively, $p < 0.01$ at 10 days post weaning pw). In the later stages of malnutrition (20 days pw) insulin binding was significantly less than in the early stage (5 days pw). (2.7% vs. 14.7% , $p < 0.01$ respectively). The decreased binding was also reflected in decreased receptor affinity in the malnourished compared to the control ($0.54 \text{ K} \times 10^8 / \text{M}$ vs. $1.4 \text{ K} \times 10^5 / \text{M}$, $p < 0.01$ at 10 days pw). There was no significant difference between the number of receptors in malnourished and control states.

The malnourished animals became insulin resistant, as suggested by a diminished glucose tolerance and a lowered insulin to glucose ratio. Insulin release was also impaired with the malnourished having a lowered plasma insulin concentration compared to the control of the same age ($8 \mu \text{U/ml}$ vs. $15.3 \mu \text{U/ml}$, $p < 0.05$; 10 days pw).

As physiological development proceeded from zero to twenty days post-weaning, the total binding (B_0) and the affinity decreased in both the malnourished and the control. This

decrease was steeper in the malnourished than the control suggesting that the effects of age on insulin receptor characteristics are exacerbated by malnutrition. In the control but not in the malnourished, the number of receptors decreased as development proceeded. In the control animals, the plasma insulin levels increased with age from 8.1 μ U/ml at weaning to 27.5 μ U/ml ($p < 0.05$). While the increase in plasma insulin values shown by the malnourished was not statistically different (10.34 μ U/ml, 20 days pw).

There was an inverse relationship between plasma insulin levels and insulin binding as the control animals increased in age.