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# TEMPORAL RESPONSE TO SOMATOTROPIN IN THE GROWING PIG

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Porcine somatotropin (pST) treatment of growing pigs results in increased lean tissue deposition and decreased adipose tissue accretion. Part of the mechanism is postulated to be via altered responsiveness or sensitivity to homeostatic signals such as insulin (Boyd and Bauman, 1988). The aim of this study was to examine the temporal response of insulin and some intermediate metabolites to pST administration.

Castrate pigs (initial BW, 71 kg) fed ad libitum six times/day were injected daily with 120 μg pST/kg BW (pST, n=4) or excipient (Con, n=4). Frequent blood samples for measurement of blood glucose and plasma non-esterified fatty acids (NEFA), glycerol and insulin were taken over the entire 24 h on days 0, 1, 2 and 7 of treatment. Data are expressed as area under the concentration vs time curve over the day. Units are mmol.h/l except for insulin where units are U.h/ml.

| | day 0 | | day 1 | | day 2 | | day 7 | | | significance[1,2] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Con | pST | Con | pST | Con | pST | Con | pST | CV,% | T | D | TxD |
| Glucose | 86.7 | 83.3 | 82.4 | 102 | 86.3 | 106 | 86.5 | 114 | 4.0 | ** | * | + |
| NEFA | 1.26 | 1.03 | 1.28 | 1.44 | 1.32 | 1.81 | 1.41 | 2.84 | 9.2 | * | *** | *** |
| Glycerol | 0.28 | 0.36 | 0.32 | 0.43 | 0.27 | 0.53 | 0.33 | 0.59 | 21.2 | ** | ns | ns |
| Insulin | 0.40 | 0.44 | 0.33 | 1.22 | 0.33 | 1.94 | 0.31 | 1.86 | 33.6 | * | * | * |

[1]T, pST treatment; D, day. [2] ns P>0.10, + P<0.10, * P<0.05, ** P<0.01, *** P<0.001

Feed intake remained constant over the first 2 days of pST treatment, but by day 7 was 31% lower (3.1 vs 2.1 kg/d, P<0.05). All metabolite and insulin concentrations exhibited post-injection increases before returning to control values (NEFA and glycerol) or to a value above control (glucose and insulin, P<0.05 by the end of day 2). In particular, the magnitude of the post-injection responses for NEFA and insulin responses were augmented by time on treatment. Peak concentrations of insulin and other metabolites occurred between 8 and 14 h post-injection whereas plasma pST concentrations peaked between 1 and 4 h post-injection. Therefore, post-injection increases were not an acute response to elevated circulating pST. Rather, pST-induced insulin resistance in hepatic and peripheral tissues is implicated. Resultant metabolic changes consistent with our observations include decreased glucose uptake by, and increased fat mobilization from, adipose tissue.

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