

Concurrent Session 6: Glycaemic Control

Insulin secretion and body composition are influenced by the feeding pattern

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Background – Insulin secretion is more closely aligned to the time of feeding in pigs fed twice daily rather than when fed *ad libitum*. Insulin plays an important role in promoting growth processes and twice daily feeding may lead to a more efficient utilisation of energy substrate for metabolism and growth.

Objective – To determine 24h profiles of plasma insulin and glucose in pigs fed either twice daily or *ad libitum* and to assess if feeding regimens affect body composition.

Design – Twenty entire male pigs were allocated randomly to individual pens in two air spaces with two rooms per air space. The pigs were maintained at 23 ± 1°C and fed either *ad libitum* or entrained to two 60 minute feeding periods (0900-1000 h and 1600-1700 h) per day for 49 days. Hourly blood samples were collected for 24 h for plasma insulin and glucose determination. Carcass body composition was assessed by computed tomography (CT).

Outcomes – There were no significant differences in plasma glucose between the two treatments. Circulating insulin concentrations were maintained at a constant level throughout the sampling period for the *ad libitum* fed pigs. The phasic fed pigs showed significant increases (P=0.05) in insulin concentrations occurring approximately 1 h after both feeding periods. There was a significant decrease in total fat percentage and a significant increase in total muscle percentage (P=0.03, for each) for the phasic fed pigs when compared to those fed *ad libitum*.

Conclusions – The data show that feeding pigs at two succint periods aligns insulin secretion to the time of feeding and this may, in turn, influence the way energy is partitioned.

Effect of a low-resource-intensive lifestyle modification program on type 2 diabetes risk in Australian adults

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Background – Large randomised controlled trials suggest that lifestyle modification can reduce risk factors for diabetes. However few low-resource-intensive lifestyle modification programs have been evaluated in Australia.

Objective – To assess the effectiveness of a low-resource-intensive lifestyle modification program incorporating resistance training (RT), and to compare a gymnasium-based to a home-based RT program, on diabetes diagnostic status and risk.

Design – A quasi-experimental two-group study was undertaken with 122 participants with diabetes risk factors - 36.9% had impaired glucose tolerance (IGT) or impaired fasting glucose (IFG) at Baseline. The intervention included: a 6-week group self-management education program; a gymnasium-based or home-based 12-week resistance training program; and a 34-week maintenance program. Fasting and 2-hour plasma glucose (FPG, 2hrPG), blood lipids, blood pressure, body composition, physical activity and diet were assessed at Baseline and Week 52.

Outcomes – Mean 2hrPG and FPG fell by 0.34 mmol/l (95% CI: -0.60, -0.08) and 0.15 mmol/l (95% CI: -0.23, -0.07) respectively. The proportion of participants with IFG or IGT decreased from 36.9% to 23.0% (p=0.006). Mean weight loss was 4.07 kg (95% CI: -4.99, -3.15). The only significant difference between resistance training groups was a greater reduction in systolic blood pressure for the gymnasium-based group (p=0.008).

Conclusions – This intervention significantly improved diabetes diagnostic status and reduced diabetes risk to a comparable degree to other low-resource-intensive lifestyle modification programs and more intensive interventions applied to people with IGT. Home-based and gymnasium-based RT did not differ significantly in their effects.