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Effect of environmental temperature on energy expenditures of the pregnant sow : Interaction with the nature of the diet (wheat straw, lucerne meal)

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This experiment demonstrated the beneficial effect of increasing dietary supplies during pregnancy and lactation on numerical productivity of sows and weight of piglets. The effect of increasing the protein level (from 280 to 350 g crude protein on an average per day of gestation and from 12 to 16 g of lysine and during lactation from 850 to 1000 g of crude protein and from 40 to 55 g of lysine for a litter of 9 piglets) cannot be singled out from the effect of a higher energy supply in late gestation (9,300 kcal DE/day versus 7,700 kcal DE/day). The same level of performance was not reached with monocereal diets composed of maize and soybean meal without ballast supplementation as compared to mixed feeds.

**Effect of environmental temperature on energy expenditures
of the pregnant sow : Interaction with the nature of the diet
(wheat straw, lucerne meal)**

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Two trials were made to quantify the effects of environmental temperature on the increased energy requirements of pregnant sows and to measure the nutritive value of wheat straw and lucerne meal as affected by environmental temperature.

Trial 1 : Four multiparous pregnant sows were kept in respiratory chambers for three consecutive 8-day periods at temperatures of 20 °C, 14 °C and 8 °C, respectively. During each period they were subjected to a high (2.7 kg/day) and to a low (2.1 kg/d) feeding level.

Trial 2 : Twelve multiparous pregnant sows were assigned to one of the three dietary treatments : 1) 2.6 kg of control diet ; 2) 2.6 kg of control diet + 600 g of straw ; 3) 2.6 kg of control diet + 600 g of lucerne meal. They were kept in respiratory chamber at environmental temperatures varying successively from 23 °C to 8 °C and from 8 °C to 23 °C by 3 °C stages (three days at each stage).

Results showed that in the pregnant sow the critical temperature was close to 23 °C and was dependent on the level of feed intake. An environmental temperature of 8 °C (relative to 20 °C) required an additional food supply of 930 and 660 g/d for the high and low level of trial 1, respectively.

Maintenance requirements of multiparous pregnant sows were similar to those of primiparous (100 to 105 kcal ME/kg^{0.75}) and were affected by the environmental temperature and the physical activity of the animals.

The DE and ME contents of straw and lucerne meal were 1,024 and 2,042 kcal DE and 1,006 and 1,775 kcal ME/kg DM, respectively. The marginal efficiency of ME was dependent on the environmental temperature and was close to 100 p. 100 at lower temperatures, which indicates a good utilization of raw materials for thermoregulation.