

A total of 650 questionnaires were sent to Kansas swine producers to assess their knowledge and awareness of environmental issues to aid in future extension program planning. Two hundred seventy-nine surveys were returned with an excellent distribution in producer size (number of pigs marketed per year), producer age, and education. By using cluster analysis, producers were categorized into three outcome (knowledge) groups (top, average, and bottom one-third) according to their answers to seven questions related to swine waste production and current environmental issues (e.g., What are synthetic amino acids?). This score was related to other questions to determine associations between knowledge group, production techniques, and industry concerns by use of Chi-square analysis and Cochran-Mantel-Haenszel association tests. Producers in the top one-third knowledge group were younger ($P < .05$), marketed more pigs ($P < .03$), and were more likely to have a 4-yr college education ($P < .005$) than the bottom one-third. Less than one-half (45.6%) of producers that responded believed nitrates in swine waste are an environmental hazard. More producers in the top one-third knowledge group than in the bottom one-third tended ($P < .20$) to believe nitrates are a potential environmental problem (50.7 vs 38.6%, respectively). Only 27.0% of producers were concerned about phosphorus content in swine waste. More producers in the top one-third group ($P < .05$) acknowledged phosphorus as an environmental concern compared with the bottom one-third (32.5 vs 17.9%, respectively). Producers with formal education beyond high school were more likely to believe that nitrates ($P < .005$) and phosphorus ($P < .02$) in swine waste are an environmental concern. In general, producers did not have a good grasp of animal waste production with 73.7% answering uncertain to a question concerning the amount of waste generated in raising one pig to market. The top one-third knowledge group had a greater percentage ($P < .004$) that knew the waste generated by one pig raised to market than the bottom one-third (29.7 vs 10.1%, respectively). More producers in the top one-third knowledge group use a lagoon for manure storage rather than a diversion terrace ($P < .07$) when compared with the bottom one-third. However, this is due to an association between producer knowledge and size with larger producers using more lagoon and pit waste storage than smaller producers, who use more diversion terraces ($P < .001$). A larger percentage of the top one-third knowledge group tended ($P < .20$) to be involved in the National Pork Producer Council Quality Assurance program than the bottom one-third (57.1 vs 39.8%, respectively). The primary source of management information for producers were magazines (31.8%), feed company representatives (20.5%), extension service (19.5%), and veterinarians (19.0%). Source of information was evenly distributed among producer size, knowledge, and education groups. Results of this survey highlight many important areas for future extension educational programs concerning environmental issues and indicate the need for tiered extension programs targeted to producer knowledge groups.

KEY WORDS: Pigs, Extension, Environmental Assessment

33 The effect of cycling and constant hot environments on mitogen-stimulated proliferation of peripheral blood lymphocytes from sows and litters. B. A. Becker* and M. L. Misfeldt, Animal Physiology Research, USDA-ARS and Dept. Molecular Microbiology and Immunology, School of Medicine, Univ. MO, Columbia.

The objectives of these studies were to determine the effects of hot cycling and hot constant environments on mitogen-stimulated proliferation of peripheral blood lymphocytes from sows/litters. In experiment I, 5 sows/litters were maintained in a thermoneutral (TN; 21°C, 50% RH) environment and 5 sows/litters were maintained in a constant hot (32°C, 70% RH) environment. In experiment II, 5 sows/litters were maintained in TN and 5 sows/litters were maintained in a cycling hot (27-32°C, 50-90% RH) environment. Peripheral blood samples were obtained by venipuncture from sows and litters on d 1, 7, 14 and 28 of both I and II. Lymphocytes were isolated from the blood and assessed for ability to proliferate as induced by mitogens phytohemagglutinin (PHA), concanavalin A (CONA) and pokeweed mitogen (PWM). In experiment I, the constant hot environment lowered proliferative responses to PHA ($P < .04$) and PWM ($P < .02$) in the litters and to PHA ($P < .001$), CONA ($P < .001$) and PWM ($P < .001$) in the sows. In experiment II, no significant effects of the cycling hot environment were found, although both sows and litters tended to have lower responses in the cycling hot environment on d 7 and 14. Serum cortisol concentrations (C) were determined by RIA in experiment I. In the litters, no differences in C were found while in the sows C was reduced ($P < .0001$). These data suggest that the ability of peripheral lymphocytes from sows and litters to respond to selected mitogens was reduced in a constant, but not cycling hot environment and that such suppression was not glucocorticoid-mediated.

Key Words: Swine, Heat, Immune

32 Relationship between ambient temperature and acute thermoregulatory response of rats to ergovaline. Q. Zhang, D. E. Spiers*, A. Al-Haidary, G. E. Rottinghaus, and G. B. Garner, University of Missouri, Columbia.

Ergovaline (EV) is the primary compound isolated from *Acremonium coenophialum*-infected tall fescue which is suspected to be responsible for fescue toxicosis. Rats were tested to determine time-related thermoregulatory responses to acute treatment with EV during thermal challenge. Isolated EV was administered to rats (5µg/kg body mass, i.p.) at controlled ambient temperature (T_a) of 8 (cold) and 32°C (hot). Treatment at cold T_a resulted in a decrease in rectal temperature (T_{re}) from 38.3 to 37.0°C at 20 min postinjection ($p \leq 0.05$) with return to preinjection level at 120 min. Tail temperature (T_{tail}) did not change with EV injection. However, metabolic rate decreased from 14.1 to 10.7 W/kg at 20 min postinjection and returned to normal at 50 min postinjection. Injection of EV at hot T_a increased T_{re} from 38.7 to 40.5°C at 60 min postinjection, with no return to preinjection level at 120 min ($p \leq 0.05$). In contrast to the cold T_a response, T_{tail} at hot T_a decreased from 37.1 to 36.3°C at 50 min postinjection and returned to control level by 120 min. Metabolic rate response at hot T_a was also opposite that at cold T_a , with an increase from 8.1 to 9.7 W/kg at 80 min postinjection that remained in effect for the duration of the test period. This study shows that thermal status of an animal at the time of treatment with ergovaline is a critical determinant of the response to this compound. Not only is the magnitude of the response altered, but the type of effector response is affected by the level of thermal challenge. This complex temperature/effect relationship results in significant shifts in body temperature that include both hyperthermic and hypothermic conditions.

Heat stress, cold stress, ergovaline.

Key Words:

34 Feeding value of light-test weight corn for steers. I.G. Rush*, B.A. Weichenthal, and B.G. Van Pelt, University of Nebraska, Scottsbluff.

Dry cracked corn (12% moisture) at two test weights (72.8 and 61.5 kg/hl) was fed in growing and finishing diets for large-frame crossbred steer calves. Using 6 pens of 9 steers each per treatment, diet dry matter consisted of 32.9% corn silage, 22.3% alfalfa haylage, 37.0% rolled corn and 7.8% protein supplement for the 71 day growing period, and 9.2% corn silage, 86.2% rolled corn and 4.6% protein supplement for the 182 day finishing period. Test weights were determined by a Dickey-John Grain Analysis Computer II and by a measuring cup and a scale. Average daily gains (ADG), dry matter (DM) intakes and feed/gain ratios were similar for the two corn test weights during the growing period. During finishing, ADG and feed/gain ratios tended to favor the lighter test weight corn. While not shown, carcass measurements were similar for the two corn test weights. Growing and finishing steer performance was not depressed by feeding dry corn at a test weight of 61.5 kg/hl.

	Corn test weight (kg/hl)	
	72.8	61.5
Initial wt, kg		
Growing	271.5	271.0
Finishing	351.9	351.9
ADG, kg		
Growing	1.13	1.14
Finishing	1.23*	1.28*
DM intake, kg		
Growing	7.49	7.61
Finishing	8.51	8.33
Feed/gain		
Growing	6.65	6.70
Finishing	6.92	6.47

*Means differ ($P < .05$)

Key Words: Corn, light-test weight, steers