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## **Housing, Husbandry, and Welfare of Swine**

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# **Housing, Husbandry, and Welfare of Swine**

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#### JOURNAL ARTICLE:

Citation # NAL Call No.

Article title.

Author. Place of publication: Publisher. Journal Title. Date. Volume (Issue). Pages. (NAL Call Number).

Example:

1 NAL Call No.: DNAL 389.8.SCH6

Morrison, S.B. Denver, Colo.: American School Food Service Association. School foodservice journal. Sept

1987. v. 41 (8). p.48-50. ill.

#### BOOK:

Citation # NAL Call Number

Title.

Author. Place of publication: Publisher, date. Information on pagination, indices, or bibliographies.

Example:

1 NAL Call No.: DNAL RM218.K36 1987

Exploring careers in dietetics and nutrition.

Kane, June Kozak. New York: Rosen Pub. Group, 1987.

Includes index. xii, 133 p.: ill.; 22 cm. Bibliography: p. 126.

#### AUDIOVISUAL:

Citation # NAL Call Number

Title.

Author. Place of publication: Publisher, date.

Supplemental information such as funding. Media format (i.e., videocassette): Description (sound, color, size).

Example:

1 NAL Call No.: DNAL FNCTX364.A425 F&N AV

All aboard the nutri-train.

Mayo, Cynthia. Richmond, Va.: Richmond Public Schools,

1981. NET funded. Activity packet prepared by Cynthia Mayo. 1 videocassette (30 min.): sd., col.; 3/4 in. + activity packet. Housing, Husbandry, and Welfare of Swine January 1991 - January 1994

#### SEARCH STRATEGY

Set Items Description

1 57562 Swine or Suidae or Suis or pig? or boar? or sow? or barrow? or gilt? or hog?

2 65908 SH=(L100 or L300 or N100)

3 5308 S2 and S3

4 1701 S3 and (hous? or facilit? or struct? or pen? or stall? or confine? or crate? or barn?)

5 1589 S4 not SH=(L500 or X380)

6 328 S5 and PY=1988:1994

7 1626 S1 and (welfare or wellbeing or well(W)being or humane or stress or behavior)

8 613 S7 and PY=1988:1994

9 1114 S1 and (handl? or care or husbandry)

10 193 S9 and PY=1988:1994

11 980 S6 or S8 or S10

12 419 S11 and PY=1991:1994

### Housing, Husbandry, and Welfare of Swine

1 NAL Call. No.: QL750.A6

The activity and straw directed behaviour of pigs offered foods with different crude protein content.

Jensen, M.B.; Kyriazakis, I.; Lawrence, A.B.

Amsterdam : Elsevier Science Publishers, B.V.; 1993 Aug.

Applied animal behaviour science v. 37 (3): p. 211-221; 1993 Aug. Includes references.

Language: English

Descriptors: Pigs; Animal behavior; Protein content

2 NAL Call. No.: 49 J82

Administration of porcine somatotropin by sustained-release implant: growth and endocrine responses in genetically lean and obese barrows and gilts. Klindt, J.; Buonomo, F.C.; Yen, J.T.

Champaign, Ill. : American Society of Animal Science; 1992 Dec. Journal of animal science v. 70 (12): p. 3721-3733; 1992 Dec. Includes references.

Language: English

Descriptors: Pigs; Somatotropin; Controlled release; Dosage effects; Blood serum; Insulin-like growth factor; Blood chemistry; Genotypes; Line differences; Sex differences; Carcass composition; Organs; Weight; Meat yield

Abstract: Previous studies have documented the effectiveness of porcine somatotropin (pST) administered by daily injection in promoting lean tissue growth in lean and obese pigs and the influence of sex and genotype. The present study examined the accretive responses in pigs of different lines and sexes to a slow release formulation of pST (pST-SR). Implants that deliver 2.0 mg of pST/d were implanted in genetically lean and obese barrows and gilts at 65 +/- .7 kg BW (mean +/- SE). Pigs received no, one, or two implants (i.e., doses of 0, 2.0, and 4.0 mg of pST/d). Pigs (four per line X sex X dose) were housed individually and continuously supplied with fresh water and a 19% CP diet containing 1.08% lysine. Pigs were slaughtered on d 0 (four per line X sex) and at the end of the trial (approximately 42 d after implantation) for estimation of initial composition and calculation of accretion rates. Blood samples were collected at d 0, 7, 14, 28, and 42 to measure endocrine and metabolite responses to pST-SR. Sustained-release PST elevated ( $P < .05$ ) circulating pST throughout the trial with peak concentrations at d 7. On d 7, serum pST concentrations in the pigs given 2.0 mg of pST-SR per day were 16-fold greater than those in control pigs, and in pigs given 4.0 mg of pST-SR per day pST concentrations were 33-fold greater than in controls. Elevated serum pST resulted in increased ( $P < .05$ ) serum concentrations of insulin-like growth factor (IGF)-I, IGF-II, insulin, and glucose and in reduced ( $P < .05$ ) concentrations of urea nitrogen and IGF binding protein (IGFBP)2. Gain was not influenced by pST-SR dose; however, feed consumption was reduced ( $P < .05$ ) and efficiency of gain was increased ( $P < .05$ ). Accretion of all body components except cold carcass weight, cecum, and untrimmed Boston butt and ham were changed ( $P < .05$ ) with PST-SR administration. Heart and stomach were the only components of the

carcass and offal whose accretion was not affected by line or sex. Increases in

3 NAL Call. No.: 41.8 AU72

The adoption of management and husbandry procedures by Western Australian pig farmers.

Robertson, I.D.; Hampson, D.J.; Mhoma, J.R.L.

Brunswick, Victoria : Australian Veterinary Association; 1991 Sep. Australian veterinary journal v. 68 (9): p. 291-293; 1991 Sep. Includes references.

Language: English

Descriptors: Western australia; Pig farming; Animal husbandry; Farm surveys

4 NAL Call. No.: 290.9 AM32T

Airflow characteristics in the floor region of a slot ventilated room (isothermal).

Jin, Y.; Ogilvie, J.R.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1992 Mar. Transactions of the ASAE v. 35 (2): p. 695-702. ill; 1992 Mar. Includes references.

Language: English

Descriptors: Pig housing; Air flow; Design; Floor area; Ventilation; Simulation models

Abstract: Accurate flow information was obtained through use of hot-wire anemometry and special calibration devices in a comprehensive experiment. Velocities in the floor region (0-0.6 m above the floor) correlated well with the inlet configuration while airflow stayed fully rotary. Non-linear models through dimensional analysis showed that the mean and the turbulent fluctuation of floor velocity were nearly proportional to the incoming air speed at the inlet and to the inlet height raised to the 0.6 power. Furthermore these flow parameters can be expressed in terms of the jet momentum number or the inlet height and the pressure difference. Stability of airflow patterns, inadequacy of air mixing and excessive air speeds at the floor are shown on an airflow rate plan based on inlet velocity versus inlet height. These are shown as system characteristic graphs which include pressure difference, zone boundaries for flow patterns, floor air speeds and RMS values, inlet jet momentum numbers, a typical fan characteristic, and a four-stage ventilation strategy for a pig barn.

5 NAL Call. No.: HD1401.A47

The Alberta hog industry problem of the 1960s: its definition and resolution. Hawkins, M.H.; Lerohl, M.L. Amsterdam : Elsevier; 1991 Jul.

Agricultural economics : the journal of the International Association of Agricultural Economics v. 5 (3): p. 211-222; 1991 Jul. In the special issue : Multidisciplinary problem-solving and subject-matter work / edited by G.L. Johnson. Includes references.

Language: English

Descriptors: Alberta; Pigmeat; Meat and livestock industry; History; Meat production; Marketing policy; Agricultural policy; Feed grains; Marketing boards; Economic impact; Market prices

Abstract: The hog industry in Western Canada in 1960s was in a state of turmoil associated with a vague, poorly understood production and marketing problem. Hog production was largely a supplementary farm activity producing an overfat product increasingly shunned by consumers. The structure, and also probably the existence, of the industry was in question. During the following 20 years, the industry changed

fundamentally as various groups achieved a better definition and understanding of the problem. A reshaping of the industry was carried out by farmers, the Provincial Government, and a variety of agricultural professionals concerned with industry structure, emerging pork markets, physical characteristics of the product, and creation of a policy environment that provided incentives for output and productivity growth. The outcome has been the development of a viable pork industry in the Province (in spite of some past and continuing hindrances to industry growth) that has substantially solved the problem.

6 NAL Call. No.: TA166.T72

Animal genetics--of pigs, oncomice and men.

Webster, J.

New York, N.Y. : Elsevier Science Publishing Co; 1993 Jan.

Trends in biotechnology v. 11 (1): p. 1-2; 1993 Jan.

Language: English

Descriptors: Pigs; Transgenics; Biotechnology; Animal welfare

7 NAL Call. No.: aS21.D27S64

Animal models in biomedical research: swine.

Smith, C.P.

Beltsville, Md. : The Library; 1991 Mar.

Special reference briefs - National Agricultural Library (U.S.). (91-06): 61 p.; 1991 Mar. Bibliography.

Language: English

Descriptors: Pigs; Medical research; Animal models; Bibliographies; Cardiovascular system; Hemodynamics; Hematology; Digestive system; Nutrition; Urinary tract; Reproduction; Immunology; Stress; Skeletomuscular system; Dermatology; Puerperium; Toxicology; Pharmacodynamics; Eyes; Mouth; Teeth; Surgery; Laboratory methods; Animal husbandry; Animal welfare

8 NAL Call. No.: QL751.B4

Armed sibling rivalry among suckling piglets.

Fraser, D.; Thompson, B.K.

Berlin, W. Ger. : Springer International; 1991.

Behavioral ecology and sociobiology v. 29 (1): p. 9-15; 1991. Includes references.

Language: English

Descriptors: Piglet feeding; Feeding behavior; Biological competition; Dentition

9 NAL Call. No.: SF395.H67 1992

Artgemasse Schweinehaltung Grundlagen und Beispiele aus der Praxis [Swine husbandry appropriate to the species].

Horning, Bernhard; Raskopf, Sabine; Simantke, Christel; Boehncke, Engelhard; Walter, Jurgen, 1950-;

Schneider, Manuel

Karlsruhe : C.F. Muller,; 1992.

256, [8] p. of plates : ill. (some col.) ; 20 cm. (Alternative Konzepte ; 78). Includes bibliographical references (p. 220-232).

Language: German

Descriptors: Swine; Swine

10 NAL Call. No.: 58.8 J82

Assessment of dustfall collectors used in livestock buildings. Barber, E.M.; Dawson, J.R.; Battams, V.A. London : Academic Press; 1991 Oct.

Journal of agricultural engineering research v. 50 (2): p. 157-165; 1991 Oct. Includes references.

Language: English

Descriptors: Pig housing; Air pollution; Dust; Collectors; Collection; Efficiency; Deposition; Sampling; Measurement; Accuracy

Abstract: The relative collection efficiency of several different types of dustfall collector was assessed over different collection intervals in a piggery. Flat plate collectors and collectors with sidewalls 10 and 50 mm high were placed on a slow-speed turntable to minimize positional effects. For each sampler type, collection intervals of 1, 3, 6 and 12 weeks were used. The collection medium was generally a 47 mm glass fibre filter located on a 75 mm diameter aluminium disc. Cellulose nitrate membrane filters were used for one treatment. The dust sedimentation rate determined from the weekly samples varied from 80 to 200 mg m<sup>-2</sup>h<sup>-1</sup> over the 12-week period. Dust deposits on the filters varied linearly with time from 2.3 mg/cm<sup>2</sup> of collector surface for the 1-week interval to 27.9 mg/cm<sup>2</sup> over 12 weeks. The measured dust sedimentation rate was about 3.0% less on the membrane filters than on the glass fibre filters and also for those collectors with the 50 mm high sidewall when compared with the flat plate collectors. The length of sample collection interval did not significantly affect the measured dust sedimentation rate. It is suggested that handling errors and edge effects may affect accuracy when deposits are greater than about 7 mg/cm<sup>2</sup> of collector surface.

11 NAL Call. No.: 41.8 AM3A

Association of environmental air contaminants with disease and productivity in swine.

Donham, K.J.

Schaumburg, Ill. : American Veterinary Medical Association; 1991 Oct. American journal of veterinary research v. 52 (10): p. 1723-1730; 1991 Oct. Includes references.

Language: English

Descriptors: Sweden; Pigs; Air quality; Swine diseases; Productivity; Air pollutants; Air microbiology; Stocking density; Pig housing; Guidelines

Abstract: A cross-sectional epidemiologic study associating air quality with swine health was conducted on 28 swine farms in southern Sweden. Correlation of housing air environment to swine diseases and productivity (data collected over the preceding 12 months) were investigated. The most prevalent swine health problems detected at slaughter were pneumonia and pleuritis. In farrowing and nursery operations, the most prevalent problem was neonatal pig mortality. Several air contaminants (dust, ammonia, carbon dioxide, and microbes) were found to be correlated with these swine health problems. Maximal safe concentrations of air contaminants were estimated on the basis of dose-response correlation to swine health or human health problems. Recommended maximal concentrations of contaminants were: dust, 2.4 mg/m<sup>3</sup>; ammonia, 7 ppm; endotoxin, 0.08 mg/m<sup>3</sup>; total microbes, 10(5) colony-forming units/m<sup>3</sup>; and carbon dioxide, 1,540 ppm. The overall quality of the ventilation system was correlated with lower concentration of ammonia, carbon dioxide, microorganisms, and endotoxin, but not with dust concentrations. High animal density was related to high ammonia and air microbe concentrations. Animal density measured as kilograms of swine per cubic meter (compared with kilograms of pig weight or swine per square meter) had the highest correlation to animal

health and air contaminants.

12 NAL Call. No.: 49 J82

Attraction of newborn piglets to auditory, visual, olfactory and tactile stimuli.

Parfet, K.A.R.; Gonyou, H.W.

Champaign, Ill. : American Society of Animal Science; 1991 Jan.

Journal of animal science v. 69 (1): p. 125-133. ill; 1991 Jan. Includes references.

Language: English

Descriptors: Piglets; Newborn animals; Stimuli; Animal behavior; Odors; Movement; Attractants

13 NAL Call. No.: TH4911.A1S9 no.85

Avvanjning av grisar i ett suggstyrt och i ett konventionellt inhysningssystem = weaning of pigs in a sow-controlled and in a conventional housing system.. Weaning of pigs in a sow-controlled and in a conventional housing system Rantzer, Dan

Lund : Sveriges lantbruksuniversitet, Institutionen for lantbrukets byggnadsteknik,; 1993.

102 p. : ill. ; 29 cm. (Rapport (Sveriges lantbruksuniversitet. Institutionen for lantbrukets byggnadsteknik) ; 84.). In Swedish, with English summary. Includes bibliographical references (p. 59-71).

Language: Swedish

14 NAL Call. No.: QL750.A6

The bases of sow--piglet identification. 2. Cues used by piglets to identify their dam and home pen.

Horrell, I.; Hodgson, J.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 Jun.

Applied animal behaviour science v. 33 (4): p. 329-343; 1992 Jun. Includes references.

Language: English

Descriptors: Piglets; Sows; Dams (mothers); Identification; Senses; Farrowing pens; Feces; Urine; Litter; Udders; Odors; Vocalization

15 NAL Call. No.: 49 J82

Basis for regulation of selenium supplements in animal diets. Ullrey, D.E.

Champaign, Ill. : American Society of Animal Science; 1992 Dec. Journal of animal science v. 70 (12): p.

3922-3927; 1992 Dec. Presented in part at a symposium entitled "Importance and Consequences of Selenium Supplementation in Livestock Production," Laramie, WY. Includes references.

Language: English

Descriptors: Animal feeding; Selenium; Feed supplements; Nutritional muscular dystrophy; Toxicity; Regulations; Nutrient requirements; Environmental impact; Pollution

Abstract: Selenium was discovered 174 yr ago but, until 1957, was given little notice by biologists or was vilified as an agent that caused toxicity in grazing ruminants and horses in the northern Great Plains. After its status as an essential nutrient was established, Se received intense scrutiny, and hundreds of papers have been published dealing with its metabolic functions and the consequences of a Se deficiency. Because regions of Se deficiency are so extensive in the United States, great efforts have been made to gain Food and Drug Administration (FDA) approval for Se supplementation of animal diets. Initially, these efforts were thwarted

by concern that Se might be carcinogenic. After this concern was resolved, researchers established supplemental Se levels that were efficacious, safe for animals, safe for humans that eat animal products, and protective of the environment. First approval of Se supplements was given in 1974 for supplementation of swine or growing chicken diets at .1 ppm. Supplements for turkey diets were approved at .2 ppm. Ultimately, in 1987, levels of supplemental Se in diets for chickens, turkeys, ducks, swine, sheep, and cattle were approved at .3 ppm. However, FDA regulations do not mention horses or zoo animals, and those who would ensure the welfare of these species by supplementing Se-deficient diets may be in violation of FDA interpretation of the law. In addition, the association of Se with death and deformities in aquatic birds at the Kesterson Reservoir in California has led to pressure on the FDA to reverse the 1987 amendments to the feed additive regulation. However, there is no established connection between Se supplementation of animal diets and the problems at the Kesterson Reservoir. If all of the animals that can be legally supplemented with Se in the United States were fed .3 ppm in their diets, the annual Se contribution to the environment would be < .5% of that originating from other anthropogenic and natural sources.

16 NAL Call. No.: QL750.A6

Behavior and extensive management of domestic sows (*Sus scrofa*) and litters. Dellmeier, G.R.; Friend, T.H. Amsterdam : Elsevier Science Publishers, B.V.; 1991 Feb. *Applied animal behaviour science*. p. 327-341; 1991 Feb. Paper presented at the "Conference on Ungulate Behavior and Management," May 23-27, 1988, College Station, Texas. Includes references.

Language: English

Descriptors: Pigs; Piglets; Animal behavior; Animal husbandry

17 NAL Call. No.: QH301.J6

Behavior of ejaculated spermatozoa from bull, boar and ram during thin-layer countercurrent partition in aqueous two-phase systems. Harrison, R.A.P.; Jacques, M.L.; Pascual Minguez, M.L.; Miller, N.G.A. Cambridge : The Company of Biologists Limited; 1992 May. *Journal of cell science* v. 102 (pt.1): p. 123-132; 1992 May. Includes references.

Language: English

Descriptors: Boars; Bulls; Rams; Spermatozoa; Separation; Methodology

18 NAL Call. No.: QL750.A6

Behaviour of piglets during weaning in a semi-natural enclosure. Jensen, P.; Stangel, G. Amsterdam : Elsevier Science Publishers, B.V.; 1992 May. *Applied animal behaviour science* v. 33 (2/3): p. 227-238; 1992 May. Includes references.

Language: English

Descriptors: Piglets; Weaning; Social behavior; Activity

19 NAL Call. No.: QL750.A6

Behaviour of semi-naturally kept sows and piglets (except suckling) during 10 days postpartum. Stangel, G.; Jensen, P. Amsterdam : Elsevier Science Publishers, B.V.; 1991 Aug. *Applied animal behaviour science* v. 31 (3/4): p. 211-227; 1991 Aug. Includes references.

Language: English

Descriptors: Piglets; Sows; Postpartum interval; Behavior change; Nesting; Interactions; Animal behavior

20 NAL Call. No.: QL750.A6

Behavioural patterns and progesterone, cortisol and prolactin levels around parturition in European (Large-White) and Chinese (Meishan) sows. Meunier-Salaun, M.C.; Gort, F.; Prunier, A.; Schouten, W.P.G.

Amsterdam : Elsevier Science Publishers, B.V.; 1991 Jul. Applied animal behaviour science v. 31 (1/2): p. 43-59; 1991 Jul. Includes references.

Language: English

Descriptors: Sows; Farrowing; Reproductive behavior; Behavior patterns; Progesterone; Prolactin; Hydrocortisone; Blood plasma; Pig breeds; Large white; Reproductive performance

21 NAL Call. No.: TD420.G48 Bd.133

Biomassengewinnung bei der Schweinegullebehandlung und Weiterverwertung in der Karpfenaufzucht [Biomass production in the treatment of swine waste and further utilization in carp husbandry].

Kirchhof, Wolfgang

Aachen : Gesellschaft zur Forderung der Siedlungswasserwirtschaft an der RWTH Aachen,; 1992.

xv, 173 p. : ill. ; 20 cm. (Gewässerschutz, Wasser, Abwasser, 133). Includes bibliographical references.

Language: German

22 NAL Call. No.: SF601.V535

Breeding and gestation facilities for swine: matching biology to facility design.

Ruen, P.D.; Dial, G.D.; Polson, D.D.; Marsh, W.E.

Philadelphia, Pa. : W.B. Saunders Company; 1992 Nov.

The Veterinary clinics of North America : food animal practice v. 8 (3): p. 475-502; 1992 Nov. In the series analytic: Swine reproduction / edited by R.C. Tubbs and A.D. Leman. Includes references.

Language: English

Descriptors: Pigs; Pig housing; Animal breeding

23 NAL Call. No.: 49 J82

Calcium and phosphorus requirement of swine from weaning to market weight. II. Development of response curves for bone criteria and comparison of bending and shear bone testing.

Combs, N.R.; Kornegay, E.T.; Lindemann, M.D.; Notter, D.R.; Wilson, J.H.; Mason, J.P.

Champaign, Ill. : American Society of Animal Science; 1991 Feb.

Journal of animal science v. 69 (2): p. 682-693; 1991 Feb. Includes references.

Language: English

Descriptors: Pigs; Calcium; Phosphorus; Bone strength; Shear strength; Dosage effects; Growth models; Mineral nutrition

Abstract: Three trials involving 251 crossbred pigs were conducted to establish response surfaces for effects of Ca/P levels (70, 85, 100, 115 and 130% of NRC [1979] estimated requirements) and time (weaning to market) on bone criteria and to compare bending and shear bone testing. Nine replicates, each consisting of five pigs, were used over the three trials. One pig per replicate was slaughtered every 4 wk following the start of the trials. Third metacarpals and metatarsals (3M) and fourth metacarpals and metatarsals (4M) were

collected at slaughter; the bone length, bending or shear stress, and dry, fat-free ash percentage (DFF%) were determined. Most bone criteria increased ( $P < .01$ ) at a decreasing rate ( $P < .05$ ) in response to increasing dietary Ca/P intake and increased linearly ( $P < .01$ ) with time on test, although bone length and stress increased at a decreasing rate with time on test. Asymptotic models relating continuous effects of total Ca + P intake ratio (CAP; expressed as a percentage of NRC) and number of days on test before slaughter to bone measurements were fit to least squares slaughter time by diet means. Bone length and DFF% reached 98% maximum at or near 100% the NRC estimated CAP level; however, to reach 98% of maximum bone shear and breaking stress higher CAP levels were required. Shear testing of bones was more desirable than bend testing as a method of determining bone strength due to reduced variability, better discrimination of Ca/P and time effects and ease of calculation.

24 NAL Call. No.: SF393.M55C37 1993

Care and management of miniature pet pigs guidelines for the veterinary practitioner., 1st ed..

Reeves, David E.; Becker, H. Neil

American Association of Swine Practitioners

Santa Barbara, Calif. : Veterinary Practice Pub. Co.,; 1993.

ix, 117 p. : ill. ; 23 cm. "Published in cooperation with the American Association of Swine Practitioners"--Cover. Includes bibliographical references and index.

Language: English

Descriptors: Miniature pigs as pets; Miniature pigs

25 NAL Call. No.: 41.8 M69

Caring for potbellied pigs.

Bradford, J.R.

Lenexa, Kan. : Veterinary Medicine Publishing Co; 1991 Dec.

Veterinary medicine v. 86 (12): p. 1173-1181; 1991 Dec. Includes references.

Language: English

Descriptors: Miniature pigs; Animal husbandry; Animal health; Nutrient requirements

26 NAL Call. No.: QL750.A6

Changes in nursing and suckling behaviour of sows and their piglets in farrowing crates.

Gotz, M.

Amsterdam : Elsevier Science Publishers, B.V.; 1991 Aug.

Applied animal behaviour science v. 31 (3/4): p. 271-275; 1991 Aug. Includes references.

Language: English

Descriptors: Sows; Piglets; Suckling; Behavior change; Farrowing pens; Postpartum interval; Animal behavior

27 NAL Call. No.: QP82.2.T4J6

Changes of body temperatures of piglets as related to halothane sensitivity and treadmill exercise.

Geers, R.; Ville, H.; Janssens, S.; Goedseels, V.; Goossens, K.; Parduyns, G.; Bael, J. van; Bosschaerts, L.; Heylen, L.

Exeter : Pergamon Press Ltd; 1992 Mar.

Journal of thermal biology v. 17 (2): p. 125-128; 1992 Mar. Includes references.

Language: English

Descriptors: Piglets; Energy metabolism; Body temperature; Heat production; Exercise; Halothane; Genes; Homozygotes; Heterozygotes; Stress; Handling; Transport of animals; Simulation

Abstract: Subcutaneous temperatures of homozygous halothane positive, homozygous halothane negative and heterozygous piglets were measured at five different body spots [abdomen, ear (left, right), neck (left, right)] under individual housing conditions and during a treadmill exercise. Statistically significant differences were observed in the levels, patterns and dynamics of sub-cutaneous temperature of the different genotypes, both at rest and during exercise. During the night subcutaneous temperatures were lowest for the positive homozygotes, but highest in this group after treadmill exercise. Subcutaneous temperatures of heterozygotes were equal to those of negative homozygotes during the night, but after exercise was equal to that of positive homozygotes. In the heterozygotes subcutaneous temperatures on the abdomen were higher than those of the base of the ears, with these being higher than those of the neck region.

28 NAL Call. No.: 284.8 F31K

The changing U.S. pork industry: a dilemma for public policy. Barkema, A.; Cook, M.L.

Kansas City, Mo. : Federal Reserve Bank of Kansas City; 1993. Economic review v. 78 (2): p. 49-65; 1993.

Includes references.

Language: English

Descriptors: U.S.A.; Pigmeat; Meat and livestock industry; Structural change; Large farms; Agricultural policy; Small farms; Economic impact; Costs

29 NAL Call. No.: SF395.P62

Combining swine housing units into a system of buildings. Muehling, A.J.; Collins, E.R. Jr; Mohling, S.;

Mohling, K. West Lafayette, Ind. : Cooperative Extension Service, Purdue University, [1978?-1990]; 1991.

Pork industry handbook. 4 p.; 1991. In the subseries: Housing. (PIH-22), revised December 1991.

Language: English

Descriptors: U.S.A.; Pigs; Pig housing; Site selection; Drainage; Pig manure; Farrowing houses; Fire prevention; Building construction; Landscaping

30 NAL Call. No.: QL750.A6

A comparison of operant responding by farrowing sows for food and nest-building materials.

Hutson, G.D.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 Aug.

Applied animal behaviour science v. 34 (3): p. 221-230; 1992 Aug. Includes references.

Language: English

Descriptors: Sows; Nesting; Feeds; Straw; Materials; Conditioned reflexes; Motivation; Animal welfare; Farrowing pens

31 NAL Call. No.: TX373.M4

A comparison of some muscle metabolites in stress susceptible and resistant landrace gilts after halothane exposure or exercise stress. Heinze, P.H.; Mitchell, G.

Essex : Elsevier Applied Science Publishers; 1991.

Meat science v. 30 (4): p. 337-349; 1991. Includes references.

Language: English

Descriptors: Gilts; Muscles; Metabolites; Stress; Susceptibility; Resistance; Exercise; Halothane; Mortality; Glycolysis; Metabolism; Pigs

32 NAL Call. No.: 290.9 AM32T

Computer simulation assessment of the thermal microenvironment of growing pigs under summer conditions.

Axaopoulos, P.; Panagakis, P.; Kyritsis, S.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1992 May. Transactions of the ASAE v. 35 (3): p. 1005-1009; 1992 May. Includes references.

Language: English

Descriptors: Greece; Pigs; Buildings; Computer simulation; Environmental temperature; Heat stress; Microenvironments; Relative humidity; Simulation models; Summer; Weather data

Abstract: The effects of outside climatic conditions on the thermal microenvironment inside a building for growing pigs (50 kg mean) were studied using a 30-year period set of hourly real weather data from the Athenian region. Transient computer simulation allowed hourly prediction of air temperature and relative humidity inside the swine unit for each year. Under Greek summer conditions (May to September) pigs are subjected to heat stress of considerable duration and intensity due to temperature, while few problems due to relative humidity occur. Furthermore, inside THI values exceeded 85 only a few hours, therefore THI cannot effectively be used as a heat-stress index.

33 NAL Call. No.: 49 J82

Computer simulation model of swine production systems. III. A dynamic herd simulation model including reproduction.

Pomar, C.; Harris, D.L.; Savoie, P.; Minvielle, F.

Champaign, Ill. : American Society of Animal Science; 1991 Jul. Journal of animal science v. 69 (7): p. 2822-2836; 1991 Jul. Includes references.

Language: English

Descriptors: Pigs; Computer simulation; Simulation models; Herd structure; Life cycle; Sows; Piglet production; Feed formulation; Body weight; Age

Abstract: A dynamic herd simulation model for a swine production unit has been developed. The model is discrete and stochastic and the appropriate random distributions have been defined from the literature or empirically estimated. Theoretical concepts and relationships presented previously are used to simulate growth and the overall life cycle of individual animals. Simulated animals are young pigs (from birth to slaughter age), gilts, and sows. Animal events are farrowing, weaning, mating, end-nursery (transfer from nursery to the growing-finishing facility), and slaughter and are processed individually using a next-event scheduling orientation package. Animals within the herd are culled for different health and reproductive reasons. Genetic parameters, diet composition, and herd management are input variables chosen by the user. The effects of nutrition, genetics, season, and other factors on several reproductive parameters are considered. Model evaluation is performed by studying the output of the model under specified herd situations. The herd model adequately simulates animal flow and dynamics of the herd.

34 NAL Call. No.: 41.8 C163

Concentration of respirable dust and bioaerosols and identification of certain microbial types in a hog-growing facility.

Butera, M.; Smith, J.H.; Morrison, W.D.; Hacker, R.R.; Kains, F.A.; Ogilvie, J.R.

Ottawa : Agricultural Institute of Canada; 1991 Jun.

Canadian journal of animal science v. 71 (2): p. 271-277; 1991 Jun. Includes references.

Language: English

Descriptors: Pigs; Dust; Aerosols; Ventilation; Particle size; Air; Air quality; Microbial contamination; Bacteria; Molds; Environmental temperature; Relative humidity

35 NAL Call. No.: 58.8 J82

Continuous aerobic treatment of piggery slurry for odour control scaled up to a farm-size unit.

Sneath, R.W.; Burton, C.H.; Williams, A.G.

London : Academic Press; 1992 Sep.

Journal of agricultural engineering research v. 53 (1): p. 81-92; 1992 Sep. Includes references.

Language: English

Descriptors: Uk; Pig housing; Pig slurry; Aerobic treatment; Odor emission; Odor abatement; Technology; Performance; Prediction; Installations; Design; Nitrogen; Losses

Abstract: Effective aerobic treatment of piggery slurry was achieved in a continuous farm scale process sited at a small piggery (2000 pigs). The plant design and the operating conditions were based on data obtained from pilot-scale studies with the aim of preventing or reducing odours from pig slurry at a minimum cost. Raw slurry was separated before passing into the main treatment vessel. Aeration was achieved by recirculating of slurry (achieving jet mixing of the tank contents) through a venturi where air was entrained. Aeration was controlled to maintain redox potential between 100 and 200 mV E(h). Slurry was added and withdrawn at hourly intervals, to provide nominal residence times of 1, 2 and 4 days. The performance of the aerobic treatment process in terms of COD reduction could be predicted using data from laboratory and pilot-scale experiments. Some allowance could be made for minor feed fluctuations but a more comprehensive model will be necessary for predictions where larger variations occur in operating conditions. Assessments were made of odour quality using dynamic dilution olfactometers for odour strength, and volatile fatty acids (VFA) concentration as an indicator of odour offensiveness. Results indicate that pilot-scale experiments may overestimate by 10-20% what can be achieved with the farm-scale plant. Nitrogen losses were greatest in the 4-day residence time trial with 56% lost in the form of N<sub>2</sub> gas following a nitrification/denitrification process. Conversely, in the short residence time trials, virtually all of the nitrogen was conserved.

36 NAL Call. No.: SF395.P62

Cooling swine.

Jones, D.D.; Driggers, L.B.; Fehr, R.L.

West Lafayette, Ind. : Cooperative Extension Service, Purdue University, [1978?-1990]; 1992.

Pork industry handbook. 6 p.; 1992. In subseries: Housing (PIH-87), revised December 1992.

Language: English

Descriptors: Pig housing; Cooling; Cooling systems; Shading; Environmental control

37 NAL Call. No.: 49 J82

Cortisol, growth hormone, and testosterone concentrations during mating behavior in the bull and boar.

Borg, K.E.; Esbenshade, K.L.; Johnson, B.H.

Champaign, Ill. : American Society of Animal Science; 1991 Aug.

Journal of animal science v. 69 (8): p. 3230-3240; 1991 Aug. Includes references.

Language: English

Descriptors: Boars; Bulls; Testosterone; Hydrocortisone; Somatotropin; Mating; Sexual behavior; Hormone secretion; Blood serum; Stress response

Abstract: Two experiments were conducted to evaluate peripheral concentrations of cortisol (C), growth hormone (GH), and testosterone (T) in bulls and boars during mating and to correlate mating behaviors with endocrine secretion in the presence of an estrous female. In Exp. 1, six sexually inexperienced mature bulls were bled every 15 min for 2 h before and 2 h after a 30-min exposure to a single, restrained, estrous cow; sampling occurred every 5 min during exposure. In Exp. 2, six sexually experienced boars were bled similarly before and after exposure to a sow and every 5 min during a 15-min exposure to a freely moving, estrous sow. Behavioral events recorded during exposure to a female included the following: flehmen responses (bulls only), mounts, penis extensions, intromissions, ejaculations, and time to first mount and first ejaculation. Of the six bulls, four completed at least one service (intromission + ejaculation), and three of six mounted the estrous cow eight or more times. Completion of one or more services resulted in significant elevations in serum C and GH concentrations, but not T concentrations, during the exposure period. Bulls mounting eight or more times also experienced significant elevations in C concentrations during exposure. Three of six boars completed at least one service. Servicing and mounting the sow fewer than five times were both associated with significant elevations in serum C concentrations. Serum concentrations of T were also elevated as a result of exposure to an estrous sow. Collectively, these data support the suggestion that specific events during natural mating activity can alter endocrine secretions of C and GH in bulls and C and T in boars.

38 NAL Call. No.: QH445.2.G45

Cosegregation of porcine malignant hyperthermia and a probable causal mutation in the skeletal muscle ryanodine receptor gene in backcross families. Otsu, K.; Khanna, V.K.; Archibald, A.L.; MacLennan, D.H.

San Diego : Academic Press, Inc; 1991 Nov.

Genomics v. 11 (3): p. 744-750; 1991 Nov. Includes references.

Language: English

Descriptors: Pigs; Porcine stress syndrome; Halothane; Hyperthermia; Inheritance; Genes; Receptors; Mutations; Thymine; Cytosine; British landrace

39 NAL Call. No.: 58.8 J82

A data-acquisition system for electronic identification, monitoring and control of group-housed pigs.

Goedseels, V.; Geers, R.; Truyen, B.; Wouters, P.; Goossens, K.; Ville, H.; Janssens, S.

London : Academic Press; 1992 May.

Journal of agricultural engineering research v. 52 (1): p. 25-33; 1992 May. Includes references.

Language: English

Descriptors: Pig housing; Groups; Data collection; Systems; Measurement; Body weight; Feed intake; Body temperature; Physical activity; Electronics; Identification; Monitoring; Automatic control; Information storage; Computers

**Abstract:** This paper describes a data-acquisition system which has been developed to measure, in parallel, individual body weight and feed intake of growing pigs kept within a group, their body temperature and physical activity. This multitude of signals originating from physiological and behavioural parameters can be collected in relation to environmental parameters on a continuous and long-term basis. A modular distributed multiprocessor architecture was developed to allow easy post-processing of collected data and to guarantee a flexible integration of data into a more extended data management system. A periodical and complete automatic transfer of locally stored data to a central computer unit has been implemented. Communication protocols are standardized allowing data transfer to and from other networks. The availability of an electronic identification system combined with various sensors will provide opportunities to study possible improvements of handling, housing and transport of farm animals.

40 NAL Call. No.: 290.9 AM32T

Defining the newborn piglet's thermal environment with an effective environmental temperature.

Hoff, S.J.; Janni, K.A.; Jacobson, L.D.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1993 Jan. Transactions of the ASAE v. 36 (1): p. 143-150; 1993 Jan. Literature review. Includes references.

Language: English

**Descriptors:** Piglets; Newborn animals; Body heat loss; Environmental factors; Environmental temperature; Literature reviews; Ventilation; Mathematical models

**Abstract:** An effective environmental temperature (EET) developed for newborn piglets describes the thermal environment by incorporating the mean radiant temperature, dry-bulb temperature, and air velocity near the newborn. The adequacy of the defined EET was analyzed by comparing with three published studies on newborn sensible heat loss. Results from the published studies indicate that the EET predicted between 87% and 98% of the variability in the data.

41 NAL Call. No.: 290.9 AM32T

Development of a portable microprocessor for measuring selected stress responses of growing pigs.

Feddes, J.J.R.; DeShazer, J.A.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1993 Jan. Transactions of the ASAE v. 36 (1): p. 201-204; 1993 Jan. Includes references.

Language: English

**Descriptors:** Pigs; Blood pressure; Body temperature; Movement; Stress; Measurement; Microprocessors; Computers; Design; Pig housing

**Abstract:** The development of a non-restrictive method for measuring selected stress responses of growing pigs in their environment is important to assess the acceptability of an environment for the pig. Blood pressure, body temperature, and animal activity are three measurements that can relate to stress of an environment. A portable microprocessor-controlled data logger was developed to measure these three parameters every 16 min over several days. These measurements were found to be accurate when obtained from the data logger strapped to a pig. Surgical techniques were developed to obtain blood pressure and body temperature. Specific data collected from this study showed that typical blood pressure for a growing pig (35 kg) is 80 +/- 5 mm Hg, blood temperature varied between 39 degrees C (thermoneutral) and 42 degrees C (surgical recovery) and the pig was active 26% of the time.

42 NAL Call. No.: SF601.C66

Diagnosis, treatment, and prevention of porcine proliferative enteritis. Connor, J.F.  
Trenton, N.J. : Veterinary Learning Systems Company; 1991 Jul. The Compendium on continuing education for the practicing veterinarian v. 13 (7): p. 1172-1176, 1178; 1991 Jul. Includes references.

Language: English

Descriptors: Pigs; Tissue proliferation; Enteritis; Campylobacter; Ileum; Hemorrhagic enteritis; Histopathology; Differential diagnosis; Antibiotics; Stress factors

43 NAL Call. No.: 41.8 C163

Discovery of selected water dispensers by newborn pigs. Phillips, P.A.; Fraser, D.  
Ottawa : Agricultural Institute of Canada; 1991 Mar.  
Canadian journal of animal science v. 71 (1): p. 233-236; 1991 Mar. Includes references.

Language: English

Descriptors: Piglets; Newborn animals; Drinkers; Drinking behavior

44 NAL Call. No.: 41.8 R312

Does a single bout of exercise cause adaptation of amino acid metabolism in pigs?.  
Poso, A.R.; Jensen-Waern, M.  
London : British Veterinary Association; 1992 Nov.  
Research in veterinary science v. 53 (3): p. 332-337; 1992 Nov. Includes references.

Language: English

Descriptors: Pigs; Exercise; Blood plasma; Amino acids

Abstract: Amino acid responses to exercise stress in well-trained racehorses and human athletes are well characterised, but the knowledge of amino acid metabolism during and after exercise in inactive animal species is limited. To study this, plasma amino acid concentrations were measured in previously unexercised pigs which performed two exercise tests on a treadmill with an interval of one week. In general, the changes in amino acids were more pronounced after the second than after the first exercise bout. Alanine, glutamine, phenylalanine and tyrosine were elevated for one hour only after the latter exercise. Twenty-four hours after the second exercise isoleucine, leucine, phenylalanine, tyrosine and valine were increased, but only isoleucine was increased after the first test. These differences between the two tests might be explained by adaptation of the amino acid metabolism after a single exercise bout and suggest that domestic pigs are well suited to study the early effects of exercise.

45 NAL Call. No.: S671.A66

Drip vs. wetted-pad evaporative cooling of farrowing houses in Oklahoma. Harp, S.L.; Huhnke, R.L.  
St. Joseph, Mich. : American Society of Agricultural Engineers; 1991 Jul. Applied engineering in agriculture v. 7 (4): p. 461-464; 1991 Jul. Includes references.

Language: English

Descriptors: Oklahoma; Pigs; Farrowing houses; Cooling systems; Comparisons; Performance testing

Abstract: A comparison of drip cooling vs. wetted-pad evaporative cooling was performed on 61 sows over three farrowings. There were no significant differences between cooling methods for piglet weight gain,

percentage of piglets weaned or sow weight loss. There was a significant difference in respiration rates between cooling methods. Respiration rate was a function of wet-bulb depression.

46 NAL Call. No.: 290.9 AM32T

Durability of truss connections in a naturally ventilated swine barn. Masse, D.I.; Munroe, J.A.; Phillips, P.A. St. Joseph, Mich. : American Society of Agricultural Engineers; 1991 Mar. Transactions of the ASAE v. 34 (2): p. 625-627; 1991 Mar. Includes references.

Language: English

Descriptors: Pig housing; Trusses; Joints (timber); Creosote; Decay; Durability; Loads; Natural ventilation; Wood strength

Abstract: This study investigated the effect of a four-year exposure in a naturally ventilated building (NVB) environment on the lateral load capacity and stiffness of truss connections. Untreated and creosote brush treated joints exposed in the NVB were compared with matched specimens that had been stored under laboratory conditions. It was found that there was no statistical difference ( $P=0.05$ ) in ultimate strength and axial stiffness between joints exposed in the barn and joints exposed in the laboratory considering either the steel gussets or plywood gussets. Other observations indicated that this barn was not a "worst case" concerning harshness of the environment local to the exposed joints.

47 NAL Call. No.: SD433.A1W6

Dynamic behavior of wood strip over elastic underlayment composite flooring subjected to light impact loads. Sueyoshi, S.; Schniewind, A.P.

Secaucus, N.J. : Springer-Verlag; 1991.

Wood science and technology v. 25 (4): p. 309-318; 1991. Includes references.

Language: English

Descriptors: Composite boards; Floors; Rubber; Dynamics; Impact loads; Vibration

Abstract: The dynamic behavior of composites consisting of wood flooring strips placed over rubber sheeting was investigated. A light impact load was applied to the center of the strips and impact force, contact duration and contact area were measured. The energy transfer from the impacting mass to the composite was estimated by measuring the restitution coefficient. Frequency analysis was conducted in order to examine the vibration characteristics of the composites.

48 NAL Call. No.: HD1.A3

Dynamic probabilistic modelling of reproduction and replacement management in sow herds. General aspects and model description.

Jalvingh, A.W.; Dijkhuizen, A.A.; Arendonk, J.A.M. van Essex : Elsevier Applied Science Publishers; 1992. Agricultural systems v. 39 (2): p. 133-152; 1992. Includes references.

Language: English

Descriptors: Sows; Pig farming; Herd structure; Farm management; Decision making; Replacement; Reproduction; Probabilistic models; Markov processes; Simulation models; Time

49 NAL Call. No.: 41.8 M69

The effect of all-in/all-out management on pigs from a herd with enzootic pneumonia.

Clark, L.K.; Scheidt, A.B.; Armstrong, C.H.; Knox, K.; Mayrose, V.B. Lenexa, Kan. : Veterinary Medicine Publishing Co; 1991 Sep. *Veterinary medicine* v. 86 (9): p. 946, 948-951; 1991 Sep. Includes references.

Language: English

Descriptors: Pigs; Pneumonia; Mycoplasma; Disease control; Disease prevalence; Disease course; Pig housing; Liveweight gain; Animal husbandry

50 NAL Call. No.: 49 W89

Effect of environmental factors on humoral and cell mediated immune parameters of growing pigs.

Rafai, P.; Kovacs, F.; Tuboly, S.; Biro, H.

Rome : International Publishing Enterprises; 1991 Jan.

*World review of animal production* v. 26 (1): p. 9-16; 1991 Jan. Includes references.

Language: English

Descriptors: Hungary; Pigs; Immune response; Cell mediated immunity; Humoral immunity; Selenium; Stress; Corticotropin; Environmental temperature; Microclimate; Feed additives; Vitamin e; Liveweight gain; Blood plasma; Hydrocortisone; Cytotoxicity; Seasons; Pig fattening

51 NAL Call. No.: 49 J82

Effect of feed intake during late development on pubertal onset and resulting body composition in crossbred gilts.

Newton, E.A.; Mahan, D.C.

Champaign, Ill. : American Society of Animal Science; 1992 Dec.

*Journal of animal science* v. 70 (12): p. 3774-3780; 1992 Dec. Includes references.

Language: English

Descriptors: Gilts; Puberty; Feed intake; Blood plasma; Progesterone; Body composition; Restricted feeding; Age; Body weight; Ovulation

Abstract: A total of 105 nonboar-exposed, F2 ([Landrace X Yorkshire] X Duroc) gilts were used in two replicates of a randomized complete block experiment to evaluate the effect of dietary feed intake on pubertal onset and subsequent body composition. Feed intakes were established at 50% of ad libitum (AL-50), 75% of ad libitum (AL-75), or at ad libitum (AL-100) levels from 4.5 to 9 mo of age. A corn-soybean meal diet fed to all gilts was formulated to meet or exceed nutrient requirements except for energy. Puberty was measured by two methods: 1) monitored once daily by back pressure applied by the herdsman or 2) from elevated plasma progesterone concentrations. Body composition was evaluated by the deuterium oxide method after plasma progesterone concentrations were elevated. Daily feed intake for the experimental period averaged 1.6, 2.3, and 3.2 kg, and the BW of gilts at 8 mo of age were 111, 131, and 154 kg for the AL-50, AL-75, and AL-100 groups, respectively. Body weight, backfat thickness, and body fat content increased linearly ( $P < .01$ ) as feed intake increased, but age at puberty was not severely influenced. A minimum body fat content or percentage did not seem to initiate pubertal onset. There was a trend for a lower percentage of the AL-50 gilts to ovulate ( $P = .08$ ) than those fed the AL-75 and AL-100 intakes. An inverse relationship resulted between the percentage of gilts that ovulated to the percentage that showed behavioral estrus. The percentage of gilts that ovulated was highest and the percentage that showed estrual behavior was lowest as feed intake increased. These data suggest that age had a greater effect on pubertal onset than did BW or body fat content, but energy restriction at approximately 50% of ad libitum levels tended to reduce the onset of ovulation. As feed intakes increased, behavioral estrus was more difficult to detect.

52 NAL Call. No.: 49 J82

Effect of feeding regimen on behavior of growing-finishing pigs supplemented or not supplemented with folic acid.

Robert, S.; Matte, J.J.; Girard, C.L.

Champaign, Ill. : American Society of Animal Science; 1991 Nov.

Journal of animal science v. 69 (11): p. 4428-4436; 1991 Nov. Includes references.

Language: English

Descriptors: Pigs; Restricted feeding; Feed additives; Folic acid; Animal behavior; Gastric ulcer; Feed intake; Body weight; Liveweight gain; Age differences

Abstract: The effect of restricted feeding on the frequency of abnormal behaviors and gastric ulcers was investigated in 72 market pigs. Half of the pigs were fed restricted (R) amounts of feed twice a day (0800 and 1600) and received 90 to 95% of the intake recorded for the other half, which were allowed ad libitum (A) access to feed with addition of feed once a day at 0800. In each feeding group, 24 pigs were supplemented with folic acid. The animals were housed in pairs and the behavior of each animal was recorded during 24 h at 18 and 20 wk of age. The results showed that the A group ate more frequently during light hours than the R group at 18 wk, but not at 20 wk. However, the frequency of eating behavior was higher in the R group than in the A group at 20 wk during the 2 h after feed distribution. Feeding regimen had an effect on the frequency of redirected behaviors during the 2 h preceding feed distribution. The percentage of time spent nibbling on the penmate was higher in R than in A pigs at 18 wk, whereas that of rooting on the penmate was higher at 20 wk. Moreover, the proportion of pigs performing redirected behaviors was higher in the R than in the A group at both ages. The overall frequency of gastric ulcers was similar in pigs given the two feeding treatments, but severe ulcers were more frequent in the R than in the A group. Some interactions were also found between feeding regimen and folic acid. At 18 wk, R pigs receiving no folic acid performed more nibbling on the penmate than all other pigs during the 2 h after feed distribution. At 20 wk, the frequency of eating was lower and that of lying higher during the 2 h after feed distribution in A pigs receiving folic acid than in all other pigs. The present results suggest that feed restriction at 90% of the ad libitum intake adversely affected fattening pigs and that supplementation with folic acid had beneficial effects on their behavior.

53 NAL Call. No.: 41.8 C163

The effect of feeding the beta-adrenergic agonist ractopamine on the behaviour of market-weight pigs.

Schaefer, A.L.; Jones, S.D.M.; Tong, A.K.W.; dePassille, A.M.B.; Rushen, J.; Merrill, J.K.

Ottawa : Agricultural Institute of Canada; 1992 Mar.

Canadian journal of animal science v. 72 (1): p. 15-21; 1992 Mar. Includes references.

Language: English

Descriptors: Pigs; Gilts; Beta-adrenergic agonists; Animal behavior; Behavior change; Sex differences

54 NAL Call. No.: 49 J82

Effect of fusaric acid on brain regional neurochemistry and vomiting behavior in swine.

Smith, T.K.; MacDonald, E.J.

Champaign, Ill. : American Society of Animal Science; 1991 May.

Journal of animal science v. 69 (5): p. 2044-2049; 1991 May. Includes references.

Language: English

Descriptors: Canada; Pigs; Fusaric acid; Poisoning; Gibberella fujikuroi; Animal behavior; Vomiting;

Hypothalamus; Neurotransmitters; 5-hydroxyindoleacetic acid; Serotonin; Ratios; Tryptophan; Synergism; T-2 toxin; Maize

Abstract: Fusaric (5-butylpicolinic) acid is a phytotoxin produced especially by *Fusarium moniliforme*, a mold commonly found in Canadian-grown corn. Experiments were conducted to determine the effects of acute doses of fusaric acid on brain neurochemistry and behavior in swine. A total of 40 crossbred barrows (initial weight 10 kg) were orally dosed with 0 or 200 mg of fusaric acid/kg of BW and five animals from each treatment were killed 4.5, 9, 18, or 36 h after dosing. All brains were dissected, and concentrations of indoleamine and catecholamine neurotransmitters and metabolites were determined. Animals in the group killed 36 h after dosing were observed for behavioral changes. Vomiting was noted in 60% of the pigs dosed with fusaric acid. These pigs also seemed more lethargic than controls and appeared sedated. The major neurochemical changes due to exposure to fusaric acid were seen in the hypothalamus 18 h after dosing. Brain tryptophan, serotonin, and 5-hydroxyindoleacetic acid all tended to be elevated by the action of fusaric acid. Brain catecholamine concentrations were largely refractory to treatment. It was concluded that exposure to acute doses of fusaric acid can cause vomiting and neurochemical changes in swine. Fusaric acid may, therefore, be acting synergistically with trichothecene mycotoxins to cause vomiting and feed refusal in pigs consuming trichothecene-contaminated feedstuffs.

55 NAL Call. No.: 442.8 L62

The effect of haloperidol on the performance of stereotyped behavior in sows. Von Borell, E.; Hurnik, J.F. Elmsford, N.Y. : Pergamon Press; 1991.  
Life sciences v. 49 (4): p. 309-314; 1991. Includes references.

Language: English

Descriptors: Sows; Haloperidol; Drug effects; Pregnancy; Animal behavior; Physical activity; Stimuli; Environmental factors

Abstract: Environmentally induced stereotypies in gestating sows were inhibited by haloperidol. This inhibitory effect was stronger in sows that directed stereotyped activities toward objects in the environment than in sows performing self-directed stereotypies. The results indicate that dopamine is involved in the performance of stereotypies in pigs, and that haloperidol seem to impair motivational arousal primarily by reducing the rewarding impact of stereotyped self-stimulation.

56 NAL Call. No.: 275.29 N272EX

Effect of Luprosil NC on pig performance.

Danielson, M.; Saner, R.; Wenninghoff, J.; Wiseman, S. Lincoln, Neb. : The Service; 1992.

EC - Cooperative Extension Service, University of Nebraska (91-219-A): p. 16-17; 1992. In the series analytic: 1992 Nebraska Swine report / Compiled by W.T. Ahlschwede.

Language: English

Descriptors: Pigs; Stress factors; Feed additives; Feed intake; Liveweight gain

57 NAL Call. No.: 41.8 AM3

Effect of management practices on the *Streptococcus suis* carrier rate in nursery swine.

Dee, S.A.; Carlson, A.R.; Winkelman, N.L.; Corey, M.M. Schaumburg, Ill. : The Association; 1993 Jul15.

Journal of the American Veterinary Medical Association v. 203 (2): p. 295-299; 1993 Jul15. Includes references.

Language: English

Descriptors: Colorado; Kentucky; Minnesota; Montana; North Dakota; South Dakota; Pigs; Streptococcus suis; Carrier state; Incidence; Animal husbandry

58 NAL Call. No.: 49 AN55

The effect of mixing unfamiliar individuals on the growth and production of finishing pigs.

Tan, S.S.L.; Shackleton, D.M.; Beames, R.M.

East Lothian, Scotland : Durrant; 1991 Feb.

Animal production v. 52 (pt.1): p. 201-206; 1991 Feb. Includes references.

Language: English

Descriptors: Pigs; Group interaction; Liveweight gain; Neuroleptics; Sex ratio; Aggressive behavior; Feed conversion

59 NAL Call. No.: 49 J82

The effect of natural toxins on reproduction in livestock. James, L.F.; Panter, K.E.; Nielsen, D.B.; Molyneux, R.J. Champaign, Ill. : American Society of Animal Science; 1992 May. Journal of animal science v. 70 (5): p. 1573-1579; 1992 May. Literature review. Includes references.

Language: English

Descriptors: Cattle; Sheep; Poisonous plants; Reproductive efficiency; Adverse effects; Toxins

Abstract: Reproductive efficiency is the most important economic factor in livestock production. Thus, the hypothalamo-pituitary-gonadal regulatory axis, accessory sexual organ functionality, and the complex events involved in fertilization, implantation, and embryonic and fetal development may be sensitive to therapeutic agents, environmental pollutants, and natural toxicants. There are many factors that adversely affect reproduction, one of which is toxic substances in the diets of animals. Toxic materials can affect reproductive success by causing abortions, interfering with libido, estrus, oogenesis, or spermatogenesis, causing emaciation and subsequent abnormal mating behavior, birth defects, and increasing the time between parturition and rebreeding. Examples of natural toxicants in poisonous plants interfering with reproduction are numerous. Abortion in livestock from locoweeds, ponderosa pine needles, broom snakeweeds, fescue, and others are reported in studies. Selenium and seleniferous forage inhibit estrus in cattle and swine. Emaciation and temporary illness from sneezeweeds, bitterweed, locoweed, larkspur, lupines, and others may interfere with mating. Embryonic loss and birth defects from Veratrum, lupines, locoweeds, poison hemlock, and so on, may occur. As suggested, toxins have many diverse and economically adverse effects on reproductive performance in livestock.

60 NAL Call. No.: QL750.A6

The effect of piglet stimuli on the posture changing behaviour of recently farrowed sows.

Cronin, G.M.; Cropley, J.A.

Amsterdam : Elsevier Science Publishers, B.V.; 1991 Apr.

Applied animal behaviour science v. 30 (1/2): p. 167-172; 1991 Apr. Includes references.

Language: English

Descriptors: Sows; Postpartum interval; Posture; Change; Piglets; Sounds; Touch; Stimulation; Maternal behavior; Farrowing pens

61 NAL Call. No.: 49 J82

Effect of porcine stress syndrome on the solubility and degradation of myofibrillar/cytoskeletal proteins. Boles, J.A.; Parrish, F.C. Jr; Huiatt, T.W.; Robson, R.M. Champaign, Ill. : American Society of Animal Science; 1992 Feb. *Journal of animal science* v. 70 (2): p. 454-464; 1992 Feb. Includes references.

Language: English

Descriptors: Pigs; Porcine stress syndrome; Pigmeat; Exudative meat; Myofibrils; Proteins; Solubility; Sarcomeres; Sds-page; Actin; Myosin; Protein degradation; Postmortem changes

Abstract: This study examined the effect of stress classification (stress-positive, stress-carrier, stress-negative) of pigs on selected properties of postmortem muscle, including protein solubility and degradation of proteins such as titin. Longissimus muscle samples were removed 45 min postslaughter, divided into samples, and stored at 0 to 2 degrees C for analysis at 0, 1, 3, 5, and 7 d postmortem. Whole-muscle samples (homogenates) and purified myofibrils were prepared from each sample for analysis by SDS-PAGE. A portion of each muscle sample also was extracted 1) with a low-ionic-strength solution to obtain a sarcoplasmic protein fraction and 2) with two different high-ionic-strength solutions to obtain a myofibrillar/cytoskeletal protein fraction for measurement of protein solubility and for analysis of extracts by SDS-PAGE. No significant differences were observed between muscle from stress-negative and stress-carrier animals in this study. Sarcoplasmic ( $P < .05$ ) and myofibrillar/cytoskeletal ( $P < .01$ ) protein solubility was lower in muscle samples from stress-positive animals than in muscle samples from stress-carrier and stress-negative animals at all postmortem times studied. The high molecular weight protein titin was degraded more slowly postmortem in muscle from stress-positive than in muscle from stress-negative animals, as observed by SDS-PAGE analysis of whole-muscle samples (homogenates) and myofibrils. The combination of lowered protein solubility and reduced rate of postmortem degradation of structural proteins such as titin may explain, at least in part, the reduced quality and protein functionality of muscle from stress-positive pigs.

62 NAL Call. No.: QL750.A6

Effect of social conditions during rearing on mating behaviour of gilts. Soede, N.M.; Schouten, W.G.P. Amsterdam : Elsevier Science Publishers, B.V.; 1991 May. *Applied animal behaviour science* v. 30 (3/4): p. 373-379; 1991 May. Includes references.

Language: English

Descriptors: Gilts; Mating behavior; Pregnancy rate; Social environment; Isolation

63 NAL Call. No.: QL750.A6

The effect of space restriction and provision of toys during rearing on the behaviour, productivity and physiology of male pigs.

Pearce, G.P.; Paterson, A.M.

Amsterdam ; New York : Elsevier, 1984-; 1993 Mar.

*Applied animal behaviour science* v. 36 (1): p. 11-28; 1993 Mar. Includes references.

Language: English

Descriptors: Pigs; Pig housing; Crowding; Stocking density; Toys; Stress; Animal behavior

64 NAL Call. No.: 49 AN55

The effect of straw on farrowing site choice and nest building behaviour in sows.

Arey, D.S.; Petchey, A.M.; Fowler, V.R.

East Lothian, Scotland : Durrant; 1992 Feb.  
Animal production v. 54 (pt.1): p. 129-133; 1992 Feb. Includes references.

Language: English

Descriptors: Sows; Farrowing; Straw; Nesting; Animal behavior; Animal welfare

65 NAL Call. No.: QL750.A6

Effect of straw on the behaviour of growing pigs.

Fraser, D.; Phillips, P.A.; Thompson, B.K.; Tennessen, T. Amsterdam : Elsevier Science Publishers, B.V.; 1991 May. Applied animal behaviour science v. 30 (3/4): p. 307-318; 1991 May. Includes references.

Language: English

Descriptors: Pigs; Straw; Litter; Agonistic behavior; Animal behavior; Diurnal activity; Young animals; Age differences; Pig housing

66 NAL Call. No.: 41.8 V641

Effects of abattoir and slaughter handling systems on stress indicators in pig blood.

Weeding, C.M.; Hunter, E.J.; Guise, H.J.; Penny, R.H.C. London : The Association; 1993 Jul03.

The Veterinary record : journal of the British Veterinary Association v. 133 (1): p. 10-13; 1993 Jul03. Includes references.

Language: English

Descriptors: Pigs; Stress; Slaughter

67 NAL Call. No.: QL750.A6

Effects of accommodation type and straw bedding around parturition and during lactation on the behaviour of primiparous sows and survival and growth of piglets to weaning.

Cronin, G.M.; Smith, J.A.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 May.

Applied animal behaviour science v. 33 (2/3): p. 191-208; 1992 May. Includes references.

Language: English

Descriptors: Sows; Piglets; Farrowing pens; Crates; Straw; Litter; Farrowing; Sow lactation; Litter size; Survival; Growth; Maternal behavior; Weaning weight; Vocalization

68 NAL Call. No.: QL750.A6

The effects of aversively handling pigs, either individually or in groups, on their behaviour, growth and corticosteroids.

Hemsworth, P.H.; Barnett, J.L.

Amsterdam : Elsevier Science Publishers, B.V.; 1991 Apr.

Applied animal behaviour science v. 30 (1/2): p. 61-72; 1991 Apr. Includes references.

Language: English

Descriptors: Gilts; Treatment; Handling; Stress; Animal behavior; Growth; Reproductive performance; Corticoids; Groups; Individuals

69 NAL Call. No.: QL750.A6

Effects of 'chemical intervention' techniques on aggression and injuries when grouping unfamiliar adult pigs. Barnett, J.L.; Cronin, G.M.; McCallum, T.H.; Newman, E.A. Amsterdam : Elsevier Science Publishers, B.V.; 1993 Apr. *Applied animal behaviour science* v. 36 (2/3): p. 135-148; 1993 Apr. Includes references.

Language: English

Descriptors: Pigs; Aggressive behavior; Chemical treatment

70 NAL Call. No.: SF601.C24

Effects of continuous stray voltage on health, growth, and welfare of fattening pigs.

Robert, S.; Lennoxville, Quebec; Matte, J.J.; Bertin-Mahieux, J.; Martineau, G.P.

Ottawa : Canadian Veterinary Medical Association; 1991 Oct.

*Canadian journal of veterinary research; Revue canadienne de recherche veterinaire* v. 55 (4): p. 371-376; 1991 Oct. Includes references.

Language: English

Descriptors: Pigs; Stray voltage; Feeding frequency; Animal welfare; Drinking behavior; Feed intake; Blood chemistry; Pig fattening

71 NAL Call. No.: QL750.A6

Effects of design of individual cage-stalls on the behavioural and physiological responses related to the welfare of pregnant pigs. Barnett, J.L.; Hemsworth, P.H.; Cronin, G.M.; Newman, E.A.; McCallum, T.H. Amsterdam : Elsevier Science Publishers, B.V.; 1991 Oct. *Applied animal behaviour science* v. 32 (1): p. 23-33; 1991 Oct. Includes references.

Language: English

Descriptors: Sows; Pig housing; Animal welfare; Aggressive behavior; Hydrocortisone; Stress; Design; Animal behavior

72 NAL Call. No.: 49 AN55

Effects of management options on creep feeding by piglets. Appleby, M.C.; Pajor, E.A.; Fraser, D.

East Lothian, Scotland : Durrant; 1991 Dec.

*Animal production* v. 53 (pt.3): p. 361-366; 1991 Dec. Includes references.

Language: English

Descriptors: Piglets; Creep feeding; Feeding behavior; Feed intake; Liveweight gain; Weaning weight; Birth weight

73 NAL Call. No.: QL750.A6

The effects of modifying the farrowing environment on sow behaviour and survival and growth of piglets.

Cronin, G.M.; Amerongen, G. van

Amsterdam : Elsevier Science Publishers, B.V.; 1991 May.

*Applied animal behaviour science* v. 30 (3/4): p. 287-298; 1991 May. Includes references.

Language: English

Descriptors: Sows; Farrowing pens; Maternal behavior; Piglets; Farrowing; Nesting; Survival; Growth rate

74 NAL Call. No.: QL750.A6

Effects of naloxone on stereotypic and normal behaviour of tethered and loose-housed sows.

Schouten, W.; Rushen J.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 Mar.

Applied animal behaviour science v. 33 (1): p. 17-26; 1992 Mar. Includes references.

Language: English

Descriptors: Sows; Naloxone; Animal behavior; Abnormal behavior; Loose housing; Tethered housing

75 NAL Call. No.: QL750.A6

Effects of pen size, partial stalls and method of feeding on welfare-related behavioural and physiological responses of group-housed pigs. Barnett, J.L.; Hemsforth, P.H.; Cronin, G.M.; Newman, E.A.; McCallum, T.H. Amsterdam : Elsevier Science Publishers, B.V.; 1992 Aug. Applied animal behaviour science v. 34 (3): p. 207-220; 1992 Aug. Includes references.

Language: English

Descriptors: Gilts; Animal welfare; Pens; Stalls; Pig housing; Space requirements; Pig feeding; Stress; Immunological deficiency; Aggressive behavior; Injuries; Hydrocortisone

76 NAL Call. No.: QL750.A6

Effects of pen size/shape and design on aggression when grouping unfamiliar adult pigs.

Barnett, J.L.; Cronin, G.M.; McCallum, T.H.; Newman, E.A. Amsterdam : Elsevier Science Publishers, B.V.; 1993 Apr. Applied animal behaviour science v. 36 (2/3): p. 111-122; 1993 Apr. Includes references.

Language: English

Descriptors: Pigs; Aggressive behavior; Pig housing

77 NAL Call. No.: QL750.A6

The effects of providing sawdust to pre-parturient sows in farrowing crates on sow behaviour, the duration of parturition and the occurrence of intra-partum stillborn piglets.

Cronin, G.M.; Schirmer, B.N.; McCallum, T.H.; Smith, J.A.; Butler, K.L. Amsterdam : Elsevier Science Publishers, B.V.; 1993 May. Applied animal behaviour science v. 36 (4): p. 301-315; 1993 May. Includes references.

Language: English

Descriptors: Sows; Sawdust; Farrowing

78 NAL Call. No.: SF391.P55

Effects of rearing on subsequent performance in pigs.

Schouten, W.G.P.

Wallingford : Commonwealth Agricultural Bureaux; 1991 Jun. Pig news and information v. 12 (2): p. 245-247; 1991 Jun. Includes references.

Language: English

Descriptors: Piglets; Animal behavior; Floor space; Agonistic behavior; Gilts; Farrowing; Farrowing pens; Maternal behavior

79 NAL Call. No.: 49 J82

The effects of recombinant porcine somatotropin on reproductive function in gilts treated during the finishing phase.

Terlouw, S.L.; Rieke, A.R.; Cantley, T.C.; Miller, L.F.; Day, B.N. Champaign, Ill. : American Society of Animal Science; 1991 Nov. Journal of animal science v. 69 (11): p. 4294-4298; 1991 Nov. Includes references.

Language: English

Descriptors: Pigs; Somatotropin; Liveweight gain; Puberty; Age; Body weight; Body fat; Estrus; Female fertility; Embryo mortality

Abstract: The objective of this study was to determine the effects of recombinant porcine somatotropin (rpST) treatment during the finishing phase on subsequent reproductive function in crossbred gilts. Forty gilts weighing 50 kg and housed in a swine finishing facility were randomly assigned to control or rpST treatment. Four control and four rpST-treated gilts were allotted per pen. Twenty rpST-treated gilts received 6 mg of rpST.gilt-1.d-1 in 1 ml of buffered carrier and 20 control gilts received 1 ml of buffered carrier-gilt-1.d-1. Injections were administered daily at 1400 in the extensor muscle of the neck. All gilts received an 18% CP diet containing 1.2% lysine. Treatment was terminated when the average weight in each pen reached 110 kg. Gilts treated with rpST gained more weight ( $P < .05$ ) than control gilts (59.8 +/- 1.0 vs 53.5 +/- 1.0 kg). Age at puberty was not different (rpST, 182.2 +/- 3.3; control 181.4 +/- 3.1 d). Prior treatment with rpST did not significantly affect length of estrus (rpST, 1.9 +/- .1; control, 1.8 +/- .1 d) or estrous cycle length (rpST, 20.6 +/- .4; control, 20.4 +/- .4 d). Ovulation rates at second estrus were similar for rpST gilts (15.1 +/- .5) and control gilts (14.4 +/- .5). More embryos ( $P = .10$ ) were recovered on d 9 to 12 of gestation from rpST-treated gilts than from control gilts (13.1 +/- .9 vs 10.7 +/- .9). In conclusion, treatment of commercial crossbred gilts with rpST from 50 to 110 kg had no adverse effect on age at puberty, length of estrus, estrous cycle length, ovulation rate, or number of embryos recovered.

80 NAL Call. No.: 442.8 J8222

Effects of treatment with butylated hydroxytoluene on the susceptibility of boar spermatozoa to cold stress and dilution.

Bamba, K.; Cran, D.G.

Colchester : The Journal; 1992 May.

Journal of reproduction and fertility v. 95 (1): p. 69-77; 1992 May. Includes references.

Language: English

Descriptors: Boars; Spermatozoa; Butylated hydroxytoluene; Cold shock; Cold resistance; Semen diluents; Semen diluent additives; Egg yolk; Semen preservation; Motility; Acrosome

81 NAL Call. No.: 49 J82

Efficacy of altrenogest in synchronizing estrus in two swine breeding programs and effects on subsequent reproductive performance in sows. Wood, C.M.; Kornegay, E.T.; Shipley, C.F.

Champaign, Ill. : American Society of Animal Science; 1992 May. Journal of animal science v. 70 (5): p. 1357-1364; 1992 May. Includes references.

Language: English

Descriptors: Pigs; Sows; Synchronization; Estrus; Female fertility; Synthetic progestogens; Farrowing rate; Litter size

**Abstract:** In two herds that used different breeding and housing schemes, altrenogest (15 mg/d) was fed for 14 d to gilts or 10 d to sows in .45 kg of a diet formulated to meet or exceed their nutrient requirements. In Herd 1 (five breeding seasons per year), 63 of 123 gilts and 40 of 70 sows in seven replications were fed in individual crates to ensure proper intake. In Herd 2 (continuous breeding), 244 of 484 gilts in 20 replications received the treated feed in individual feeding stalls to which animals had free access. Average and median days to estrus were reduced ( $P < .01$ ) for treated gilts and sows compared with controls in both herds. Of 29 treated gilts that did not mate or become pregnant, three had cystic follicles, compared to 1 of 14 controls. There were no statistically significant treatment differences in litter size born or number stillborn pigs in either herd, but farrowing rates of cycling gilts were 8% lower ( $P < .05$ ) in Herd 2 for treated gilts than for controls. Overall, altrenogest could be a valuable tool for improving reproductive efficiency by allowing producers to better control the estrous cycle.

82 NAL Call. No.: SF395.P62

Energy conservation in ventilating and heating swine buildings. Fehr, R.L.

West Lafayette, Ind. : Cooperative Extension Service, Purdue University, [1978?-1990]; 1991.

Pork industry handbook. 5 p.; 1991. In the subseries: Housing. (PIH-92), revised December 1991.

Language: English

Descriptors: U.S.A.; Pigs; Pig housing; Energy conservation; Ventilation; Heating costs; Temperature; Fans

83 NAL Call. No.: S671.A66

Energy usage on Kansas livestock and dairy farms.

Slocombe, J.W.; Feyerherm, A.M.; Stetson, L.E.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1992 May. Applied engineering in agriculture v. 8 (3): p. 389-392; 1992 May. Includes references.

Language: English

Descriptors: Kansas; Livestock enterprises; Energy consumption; Electrical energy; Regional surveys

**Abstract:** Four thousand Kansas agricultural producers were surveyed to determine electrical equipment and energy management practices used for grain, livestock, and dairy production in 1989. Completed questionnaires were obtained from 1177 producers, of which 519 and 68 were livestock and dairy producers, respectively. Data from these producers were analyzed to determine types of equipment used for livestock and dairy production by geographic location and variables that could be used to predict electrical energy consumption for livestock and dairy producers. Over 70% of the livestock producers reported using an average of 2157 kWh of electricity per month in 1989. Less than 20% of the livestock producers used both single- and three-phase electricity on their operation. Forty-two percent of the swine producers reported using an average of 11 ventilation fans in all swine buildings. An average of one ventilation fan was used per 100 head of swine. Electricity and liquid petroleum gas (LPG) were the most common energy sources used to heat on-farm agricultural facilities. Dairy producers used an average of 3989 kWh of electricity per month in 1989. One-third of the producers used both single- and three-phase electricity in 1989. The most popular type of milking equipment used by dairy producers was the highline pipeline milker. Liquid petroleum gas was the most popular energy source for water heaters up to 80 gallons. Seventy-two percent of the producers reported that no heat reclaimer was connected to the water heater(s) to utilize waste heat from the bulk milk tank compressor.

84 NAL Call. No.: QL55.I5

Environment enrichment for the laboratory pig.

Batchelor, G.R.

Sussex : The Institute; 1991 Dec.

Animal technology : journal of the Institute of Animal Technology v. 42 (3): p. 185-189; 1991 Dec. Includes references.

Language: English

Descriptors: Pigs; Environment; Enrichment; Animal welfare; Animal husbandry

Abstract: This brief paper attempts to illustrate the simple ideas that can be used to enhance the environment of the laboratory pig. Ideas that have been part of the husbandry routine at Stanmore for over five years. It does not describe the behaviour of the pig in any detail but suggests that with a little time and effort, and in our case at no cost, the environment of the laboratory pig can be made more stimulating, resulting in animals that have an increased behavioural repertoire, are largely stress-free and are a constant pleasure to work with (Figure 1).

85 NAL Call. No.: S592.7.A1S6

Environmental aspects of the chloragogenous tissue of earthworms. Fischer, E.; Molnar, L.

Exeter : Pergamon Press; 1992 Dec.

Soil biology and biochemistry v. 24 (12): p. 1723-1727; 1992 Dec. In the special issue ISEE 4. Proceedings of the "4th International Symposium on Earthworm Ecology," June 11-15, 1990, Avignon, France / edited by A. Kretzschmar. Includes references.

Language: English

Descriptors: Eisenia fetida; Animal tissues; Cells; Environmental factors; Environmental impact; Histology; Cytology

Abstract: Environmental factors affecting the chloragogenous tissue of the manure worm, *Eisenia fetida* and other oligochaetes were surveyed. Chloragocytes might be affected--detectable by karyometric methods--by hydration, desiccation, cold stress, hypoxia, saline load, or by diverse xenobiotics. Chloragocyte depletion may be stimulated by some pesticides. Paraquat toxication can cause an almost full depletion of the chloragogenous tissue as we observed, followed in survivors by a renewal of this tissue. Experimental cold stress induced a marked increase of the Carnoy-insoluble pigmentation of the chloragosomes in juvenile worms. Moderate accumulation of such pigments could be observed on the effect of saline load. The elemental composition of chloragosomes might be markedly influenced by some environmental factors, including heavy metals. Experimentally-induced alterations of the chloragogenous tissue may contribute to the adaptation of the earthworms to variable conditions of their environments.

86 NAL Call. No.: 41.8 V641

Environmental factors affecting the severity of pneumonia in pigs. Done, S.H.

London : The Association; 1991 Jun22.

The Veterinary record : journal of the British Veterinary Association v. 128 (25): p. 582-586; 1991 Jun22. Includes references.

Language: English

Descriptors: Pigs; Pneumonia; Disease course; Environmental factors; Meteorological factors; Populations; Social environment; Animal husbandry; Air pollutants

87 NAL Call. No.: 290.9 AM32T

Environmental temperature control by the pig's comfort behavior through image analysis.

Geers, R.; Ville, H.; Goedseels, V.; Houkes, M.; Goossens, K.; Parduyns, G.; Van Bael, J.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1991 Nov. Transactions of the ASAE v. 34 (6): p. 2583-2586; 1991 Nov. Includes references.

Language: English

Descriptors: Pigs; Animal behavior; Body temperature regulation; Pig housing; Environmental temperature; Heat regulation

Abstract: During four experiments with six female piglets, the thermoregulatory behavior of the piglets was quantified by visual observation and by automated image analysis. The collection number of images representing pigs sleeping side by side and touching each other, as well as the occupation ratio of piglets being calculated on pixel values within predefined windows, may serve as set-point values for environmental temperature controllers. But this observational procedure has to be linked to the engineering of a gradient of an effective environmental temperature within a pen.

88 NAL Call. No.: SF601.C66

Enzootic mortality among piglets between birth and weaning. Vaillancourt, J.P.; Dial, G.D.; Tubbs, R.C.

Trenton, N.J. : Veterinary Learning Systems Company, Inc; 1991 Oct. The Compendium on continuing education for the practicing veterinarian v. 13 (10): p. 1642-1645, 1648-1650; 1991 Oct. Includes references.

Language: English

Descriptors: Piglets; Weaning; Prewaning period; Perinatal mortality; Trauma; Diarrhea; Infection; Deformities; Record keeping; Validity; Environmental temperature; Litter size; Birth weight; Animal nutrition; Pig feeding; Pig housing; Floors; Litter; Animal husbandry; Farrowing; Sex differences; Genetics; Seasonal fluctuations; Medical treatment

89 NAL Call. No.: SF396.3.K37 1991

Ethologische und verhaltensphysiologische Untersuchungen zur Anbinde- und Gruppenhaltung tragender Sauen der Rassen Deutsches Edelschwein und Pietrain [Ethological and behavior physiological studies on tether and group rearing of pregnant sows of the German Large White and Pietrain breeds]. Kattner, Christa, Bonn? : Rheinische Friedrich-Wilhelms-Universitat?, 1991?; 1991. 178 p. : ill. ; 30 cm. English summary. Vita. Includes bibliographical references (p. 135-165).

Language: German

Descriptors: Sows

90 NAL Call. No.: 49 J82

Evaluation of a bone biopsy technique for determining the calcium and phosphorus status of swine from weaning to market weight. Combs, N.R.; Kornegay, E.T.; Lindemann, M.D.; Notter, D.R.; Welker, F.H. Champaign, Ill. : American Society of Animal Science; 1991 Feb. Journal of animal science v. 69 (2): p. 664-672; 1991 Feb. Includes references.

Language: English

Descriptors: Pigs; Bone mineralization; Calcium; Phosphorus; Bone ash; Mineral nutrition; Requirements;

## Biopsy; Diagnosis

**Abstract:** Tibia biopsies were taken from 75 live pigs at 4-wk intervals and from 251 slaughtered pigs to evaluate bone biopsy as a procedure for determining Ca/P status in pigs fed 70, 85, 100, 115 and 130% of the NRC (1979) estimated dietary Ca and P percentage requirements from weaning to market. Least squares means and SE of live and slaughter biopsy wet weight, ash weight and dry, fat-free ash percentage (DFF%) were compared at each time in each trial and found not to differ. Diet and time effects on ash weight, ash percentage of wet weight and DFF% of the biopsy core also did not differ greatly between slaughter and live biopsies and generally responded linearly and quadratically ( $P < .01$ ) to increasing Ca/P level and time. Biopsy measures were correlated ( $P < .05$ ) with third and fourth metacarpal and metatarsal length, bending and shear stress and DFF%. Means for slaughter biopsy DFF% did not differ greatly from the average of third and fourth metacarpal and metatarsal DFF% from slaughter pigs. Means for live and slaughter biopsy DFF% were lower than those for whole bones for the 70 and 85% NRC estimated Ca/P levels, but not for the 100, 115 and 130% NRC levels. Bone biopsy offers potential as a reliable noninvasive procedure for monitoring Ca/P status of swine from weaning to market, but it needs further study for use in Ca/P research in swine.

91 NAL Call. No.: S671.A66

Evaluation of a pig nursery annex ventilation system operating under summer conditions.

Panagakos, P.; Kyritsis, S.; Tambouratzis, D.; Papadopoulos, G. St. Joseph, Mich. : American Society of Agricultural Engineers; 1991 May. Applied engineering in agriculture v. 7 (3): p. 353-357; 1991 May. Includes references.

Language: English

Descriptors: Pig housing; Ventilation; Field tests; Evaluation

**Abstract:** Two field trials, lasting five weeks each, were conducted during the summer of 1989 to evaluate the effectiveness of an annex ventilation system used to supply summer ventilation rates in a swine nursery building. Assessment was based both on climatic environment data and growth response of 96 early weaned crossbred pigs, three to four weeks old when weaned. Under mild summer conditions the ventilation system provided sufficient control of the environment and resulted in animal heat stress of short duration and intensity. During periods of very hot weather the system failed to provide a thermal microenvironment within acceptable limits and pigs were subjected to longer intervals of heat stress. Heat stress degree-hours during Trial II were more than two times those of Trial I, but this did not seem to have a negative effect on the animals' growth performance.

92 NAL Call. No.: 49 J82

Evaluation of housing systems for sows.

Hartog, L.A. den; Backus, G.B.C.; Vermeer, H.M.

Champaign, Ill. : American Society of Animal Science; 1993 May.

Journal of animal science v. 71 (5): p. 1339-1344; 1993 May. Includes references.

Language: English

Descriptors: Pig housing; Sows; Animal welfare; Sow feeding; Feed intake; Body weight; Reproductive performance; Animal behavior; Groups

**Abstract:** Housing systems of sows have to meet the requirements of the sow and the requirements of the producer. Criteria that have to be taken into account are productivity, labor input and management, welfare and health, and economy. Different housing systems for sows are described with respect to these criteria.

93 NAL Call. No.: 49 J82

Evaluation of long-term somatotropin implants in finishing pigs. Hacker, R.R.; Deschutter, A.; Adeola, O.; Kasser, T.R. Champaign, Ill. : American Society of Animal Science; 1993 Mar. *Journal of animal science* v. 71 (3): p. 564-570; 1993 Mar. Includes references.

Language: English

Descriptors: Pigs; Somatotropin; Pig fattening; Feed conversion; Carcass weight; Carcasses; Fat percentage; Performance; Sex differences; Meat cuts; Meat composition; Meat quality

Abstract: Ninety pigs were used to investigate the efficacy of long-term implants of porcine somatotropin (pST) in improving growth, feed:gain ratio, and carcass characteristics in pigs at three dose levels (0-, 100-, and 200-mg pST implant) from 71 to 99 kg live weight. The use of long-term implants did not alter ( $P > .05$ ) growth rate. Administration of the 200-mg pST implant resulted in a 15% reduction in feed consumption, and this reduction was significant ( $P < .05$ ). The feed:gain ratio was improved ( $P < .05$ ) in pigs that received the 200- compared with 0-mg pST implant (3.2 vs 2.62 of kg feed/kg of gain). In pigs that received the 200- or 100-mg pST implant, there was a reduction ( $P < .05$ ) in carcass weight; however, carcass length was similar ( $P > .05$ ) regardless of pST treatment. Administration of the 200-mg pST implant resulted in 25 and 38% reductions ( $P < .05$ ) in last rib fat and leaf fat compared with the 0-mg pST implant. The weights of kidneys and head were increased by the pST administration. The weights of wholesale cuts were not affected by the administration of the pST implant. However, separable skin and fat from the ham, loin, and picnic were lower ( $P < .05$ ) in pigs that received the 200-mg pST than in pigs that received the 0-mg pST implant. Meat color and structure were similar across pST treatments, indicating that the use of long-term pST implants was not detrimental to meat quality. The results represent a significant step in the efficacious use of a long-term delivery system for pST as opposed to the laborious daily injection schedule.

94 NAL Call. No.: 49 J82

Evaluation of methods of providing supplemental heat to newborn pigs during and after farrowing.

Ogunbameru, B.O.; Kornegay, E.T.; Wood, C.M.

Champaign, Ill. : American Society of Animal Science; 1991 Oct.

*Journal of animal science* v. 69 (10): p. 3939-3944; 1991 Oct. Includes references.

Language: English

Descriptors: Piglets; Newborn animals; Heating; Heat lamps; Environmental temperature; Prewaning period; Mortality; Farrowing

Abstract: Two experiments were conducted to evaluate systems of providing supplemental heat to newborn pigs during and after farrowing. In Exp. 1, 35 sows were randomly allotted to farrowing crates with two supplemental heat treatments: 1) two lateral 250-watt heat lamps; and 2) two lateral heat lamps, plus a 250-watt heat lamp behind the sow during farrowing. In Exp. 2, 72 sows were randomly assigned to farrowing crates with four supplemental heat treatments: 1) one lateral 250-watt heater; 2) one lateral heater plus a 250-watt heater behind the sow during farrowing; 3) a hover with 100-watt light bulb; and 4) a hover with light bulb plus heater behind the sow during farrowing. The average farrowing house temperature was 18.9 degrees C in Exp. 1 and 21.6 degrees C in Exp. 2. Results showed no significant treatment effects on preweaning pig survival or growth rates in either experiment. Thus, providing a heat lamp at the rear of the sow during parturition was not beneficial and would increase operating costs. Hovers have a higher initial cost than conventional heat lamps or heaters, but they would have a much lower operating cost. Hovers may offer swine producers a way of reducing energy costs without affecting preweaning pig survival and performance.

95 NAL Call. No.: 49 J82

Evaluation of recombinant porcine somatotropin on growth performance, carcass characteristics, meat quality, and muscle biochemical properties of Belgian Landrace pigs.

Fabry, J.; Demeyer, D.; Thielemans, M.F.; Deroanne, C.; Voorde, G. van de; Deroover, E.; Dalrymple, R.H. Champaign, Ill. : American Society of Animal Science; 1991 Oct.

Journal of animal science v. 69 (10): p. 4007-4018; 1991 Oct. Includes references.

Language: English

Descriptors: Pigs; Somatotropin; Growth; Feed conversion; Feed intake; Carcass composition; Muscles; Protein content; Meat quality; Ph; Organs; Weight; Fat thickness; Tenderness; Dosage effects

Abstract: The dose related effects of recombinant porcine somatotropin (rpST) on growth, carcass characteristics, muscle properties, and meat quality were investigated in lean Belgian Landrace finishing pigs. Ninety-six pigs (48 barrows and 48 gilts) were injected daily with either vehicle, 1.5, 3, or 6 mg of rpST from 60 to 97.5 kg live weight. Each treatment group consisted of six pens of four pigs each (two of each sex). Pigs were given ad libitum access to a high-protein (20.4% CP) cereal-based diet. Administration of rpST increased ( $P < .05$ ) growth rate (16.3 to 25.4%) and improved ( $P < .05$ ) feed efficiency (16.9 to 29.4%). Feed consumption was reduced (12%;  $P < .05$ ) only in the 6 mg of rpST group. Liver, kidney, and heart weights were increased ( $P < .05$ ) in the 3 and 6 mg of rpST groups. Although the Belgian Landrace pigs are bred for superior carcass quality, rpST further improved ( $P < .05$ ) carcass composition at aH dose levels as evidenced by a reduction (10 to 50%) in a number of subcutaneous fat depth measurements, an increase (10 to 20%) in longissimus muscle area, and an improvement in the lean cut:fat cut ratio. Rate of pH decline in the gluteus and longissimus muscles was similar, but rapid, in all groups (pH after 30 min = 5.74 to 5.94); the ultimate (24 or 72 h) pH was .15 to .2 pH units higher ( $P < .05$ ) in the pigs that received the 3 and 6 mg of rpST doses. Longissimus tenderness (measured by shear force and penetration), water holding capacity, myofibrillar protein concentration, and sarcomere length were not affected by rpST administration. Protein content of the longissimus was increased ( $P < .05$ ) by rpST treatment, whereas percentage of lipid, moisture, DM, and collagen were unchanged. In summary, administration of rpST to genetically lean finishing pigs stimulated growth performance and improved carcass composition and had no adverse effects on meat quality, processing properties, or tenderness.

96 NAL Call. No.: QP251.A1T5

Evaluation of systems for collection of porcine zygotes for DNA microinjection and transfer.

Williams, B.L.; Sparks, A.E.T.; Canesco, R.S.; Knight, J.W.; Johnson, J.L.; Velandier, W.H.; Page, R.L.; Drohan, W.N.; Kornegay, E.T.; Pearson, R.E. Stoneham, Mass. : Butterworth-Heinemann; 1992 Sep.

Theriogenology v. 38 (3): p. 501-511; 1992 Sep. Includes references.

Language: English

Descriptors: Sows; Gilts; Superovulation; Estrus; Synchronization; Zygotes; Transgenics; Ovulation rate; Dna; Injection; Embryo transfer; Fertilization; Pregnancy rate

Abstract: Crossbred gilts and sows ( $n = 116$ ) were used for the collection of 1-cell zygotes for DNA microinjection and transfer. Retrospectively, estrus synchronization and superovulation schemes were evaluated to assess practicality for zygote collection. Four synchronization and superovulation procedures were used: 1) sows were observed for natural estrous behavior; 1000 IU human chorionic gonadotrophin (hCG) was administered at the onset of estrus (NAT); 2) cyclic gilts were synchronized with 17.6 mg altrenogest (Alt)/day for 15 to 19 days followed by superovulation with 1500 IU pregnant mares serum

gonadotropin (PMSG) and 500 IU hCG (LALT): 3) gilts between 11 and 16 days of the estrous cycle received 17.6 mg ALT for 5 to 9 days and PMSG and hCG were used to induce superovulation (SALT); and 4) precocious ovulation was induced in prepubertal gilts with PMSG and hCG (PRE). A total of 505 DNA microinjected embryos transferred into 17 recipients produced 7 litters and 50 piglets, of which 8 were transgenic. The NAT sows had less ( $P < 0.05$ ) ovarian activity than gilts synchronized and superovulated by all the other procedures. Synchronization treatments with PMSG did not differ ( $P > 0.05$ ) in the number of corpora hemorrhagica or unovulated follicles, but SALT and PRE treatments had higher ovulation rates than LALT (24.7 +/- 2.9, 24.3 +/- 1.8 vs 11.6 2.7 ovulations; mean +/- SEM). The SALT and PRE treatments yielded 12.3 +/- 2.6 and 17.7 +/- 1.7 zygotes. Successful transgenesis was accomplished with SALT and PRE procedures for estrus synchronization and superovulation.

97 NAL Call. No.: S494.5.S86S8

Facility design and practices of a low-input housing system for a feeder-pig operation.

Arellano, P.E.; Pijoan, C.; Jacobson, L.D.

Binghamton, N.Y. : Food Products Press; 1993.

Journal of sustainable agriculture v. 3 (3/4): p. 49-61; 1993. Includes references.

Language: English

Descriptors: Pig housing; Design

98 NAL Call. No.: HD1761.A1M5 no.91-1

Farm animal welfare crisis or opportunity for agriculture?. Halverson, Marlene

University of Minnesota, Dept. of Agricultural and Applied Economics St. Paul, Minn. : Dept. of Agricultural and Applied Economics, University of Minnesota.; 1991.

68 leaves : ill. ; 28 cm. (Staff paper P 91-1). January 1991. Includes bibliographical references (leaves 52-59).

Language: English

Descriptors: Animal welfare; Animal health; Livestock; Swine

99 NAL Call. No.: SF91.F38 1992

Farm animals and the environment.

Phillips, Clive; Piggins, David

Wallingford : C.A.B. International.; 1992.

xii, 430 p. ; 25 cm. "... international conference on Farm Animals and the Environment held on 4-5 September 1991 at the University College of North Wales, Bangor"--P. xi.

Language: English

Descriptors: Livestock; Animal welfare; Domestic animals

100 NAL Call. No.: Videocassette no.1359

Farm animals with care produced for Glaxo Group Research in association with the Institute of Animal Technology [by] Datascope Communications. Datascope Communications, Glaxo Group Research Limited, Institute of Animal Technology

England? : Datascope.; 1991.

2 videocassettes (65 min.) : sd., col. ; 1/2 in.

Language: English

Descriptors: Livestock; Animal health; Animal welfare

Abstract: Illustrates regimes for housing and care for sheep, goats, pigs, cattle, and poultry as well as providing breeding information and demonstrating some routine health care procedures and blood sampling techniques.

101 NAL Call. No.: QL55.A1L3

A fast and simple technique for jugular catheterization in adult sows. Zanella, A.J.; Mendl, M.T.

London : Royal Society of Medicine Services; 1992 Jul. *Laboratory animals* v. 26 (3): p. 211-213; 1992 Jul. Includes references.

Language: English

Descriptors: Sows; Jugular vein; Catheters; Ears; Blood sampling; Hydrocortisone

Abstract: Obtaining measures of an animal's physiological state with minimum disturbance to the animal is essential in animal welfare studies and it is also ethically desirable. A simple technique for implanting a temporary jugular catheter in adult sows is described. The technique involves implantation via an ear vein and can be performed in 5-7 min. Local but not general anaesthetic is required. The technique has no effect on basal levels of salivary cortisol 1-2 h later, suggesting that it has no long term stress consequences. Catheters continue to function perfectly well after 4 h.

102 NAL Call. No.: QL750.A6

Feeding order of sows at an individual electronic feed station in a dynamic group-housing system.

Bressers, H.P.M.; Brake, J.H.A. te; Engel, B.; Noordhuizen, J.P.T.M. Amsterdam : Elsevier Science Publishers, B.V.; 1993 Apr. *Applied animal behaviour science* v. 36 (2/3): p. 123-134; 1993 Apr. Includes references.

Language: English

Descriptors: Sows; Feeding behavior; Pig housing

103 NAL Call. No.: 290.9 AM32T

Feeding patterns of growing pigs at warm constant and cyclic temperatures. Xin, H.; DeShazer, J.A.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1992 Jan. *Transactions of the ASAE* v. 35 (1): p. 319-323; 1992 Jan. Includes references.

Language: English

Descriptors: Nebraska; Pig feeding; Environmental temperature; Feed intake; Feeding behavior; Feeding frequency; Unrestricted feeding

Abstract: Feeding behavior of ad libitum-fed, 39-kg, crossbred gilts was investigated under mean ambient temperatures of 30.8 degrees C with 0, 7, and 16.6 degrees C cycles. Average meal size, 160 to 170 g/pig; meal duration, 13.3 to 14.3 min; and ingestion rate, 12.2 g/min-pig did not appear to be influenced by the temperature conditions. However, meal frequency, 9 to 11 per-day, tended to be reduced by elevated hours of exposure to high temperatures. Consequently daily feed intake of the pigs was significantly less in the 16.6 degrees C cycle treatment than in the 0 or 7 degrees C cycle treatments ( $P < 0.01$ ). Feed consumed during the lighting period (0600 h to 2100 h) accounted for 75%, 61%, and 37% of daily feed intake for the 0, 7, and 16.6 degrees C cycle treatments, respectively. Pigs under the 0 degrees C cycle had most feeding activities in

the afternoon and evening (55% of daily feed intake). In contrast, pigs under the 16.6 degrees C cycle had most feeding events at night and early morning (91% of daily feed intake).

104 NAL Call. No.: QR53.B56

Free and immobilized cultures of *Spirulina maxima* for swine waste treatment. Canizares, R.D.; Dominguez, A.R.; Rivas, L.; Montes, M.C.; Travieso, L.; Benitez, F.

Middlesex : Science and Technology Letters; 1993 Mar.

Biotechnology letters v. 15 (3): p. 321-326; 1993 Mar. Includes references.

Language: English

Descriptors: Spirulina; Pigs; Excreta; Biological treatment; Immobilization; Ammonium nitrogen

Abstract: We have analyzed the behavior of *Spirulina maxima* at increasing concentration of ammonium nitrogen present in swine waste when it is either growing in suspension or immobilized in polymeric supports. We compared the response of *Spirulina maxima* growth to different concentrations of aeration stabilized swine waste (total phosphorus, ammonium nitrogen) as a way to determine the treatment efficiency of both systems. At a dilution of 50% of swine waste, the suspended system reached the best results for biomass concentration and nutrient removal. In the immobilized system at dilutions of 25 and 50% of swine waste, more than 90% ammonium nitrogen removal was obtained, and the optimal cell concentration for immobilization was 2 g/l (wet basis).

105 NAL Call. No.: QL750.A6

Genetic variation of sitting frequency and duration in pigs. McGlone, J.J.; Akins, C.K.; Green, R.D.

Amsterdam : Elsevier Science Publishers, B.V.; 1991 May. Applied animal behaviour science v. 30 (3/4): p. 319-322; 1991 May. Includes references.

Language: English

Descriptors: Pigs; Heritability; Animal behavior; Incidence; Duration; Genetic variation

106 NAL Call. No.: SF757.R36 no.31

Group-housing of lactating sows studies on health, behaviour and nest temperature.

Ebner, Jakob

Skara : Swedish University of Agricultural Sciences, Faculty of Veterinary Medicine, Dept. of Animal Hygiene,; 1993.

108 p. : ill. ; 24 cm. (Rappart (Sveriges lantbruksuniversitet. Institutionen for husdjurshygien ; 31.). Abstract inserted. Includes bibliographical references (p.101-108).

Language: English

107 NAL Call. No.: 49 AN55

Growth characteristics and carcass composition of pigs with known genotypes for stress susceptibility over a weight range of 70 to 120 kg. Aalhus, J.L.; Jones, S.D.M.; Robertson, W.M.; Tong, A.K.W.; Sather, A.P. East Lothian, Scotland : Durrant; 1991 Apr.

Animal production v. 52 (pt.2): p. 347-353; 1991 Apr. Includes references.

Language: English

Descriptors: Pigs; Growth; Genetic differences; Carcass composition; Tissues; Halothane; Genes

108 NAL Call. No.: QL750.A6

Growth, response to humans and corticosteroids in male pigs housed individually and subjected to pleasant, unpleasant or minimal handling during rearing.

Paterson, A.M.; Pearce, G.P.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 Sep.

Applied animal behaviour science v. 34 (4): p. 315-328; 1992 Sep. Includes references.

Language: English

Descriptors: Pigs; Male animals; Growth rate; Handling; Pig housing; Man; Interactions; Hydrocortisone; Blood plasma; Stress; Animal behavior

109 NAL Call. No.: NBUS533 F66 N42 no.357

Guide for evaluating livestock showmanship contests beef, sheep, swine. Wolverton, Doyle R.

Nebraska Cooperative Extension Service

Lincoln : Neb. : Cooperative Extension Service, University of Nebraska,; 1991. 13 p. ; 23 cm. (Nebraska Cooperative Extension 4-H ; no. 357.).

Language: English

Descriptors: Livestock; Beef cattle; Sheep; Swine

Abstract: Judging a showmanship contest is based on preparation of animals for show, their apparent training, and the appearance and behavior of the participating exhibitors. This guide is an outline of desirable showmanship practices and the relative importance of each.

110 NAL Call. No.: TX373.M4

Haematological and clinico-chemical profiles of barrows at the farm and at slaughter.

Odink, J.; Elbers, A.R.W.; Smeets, J.F.M.; Visser, I.J.R.; Alsemgeest, P.; Wijngaards, G.

Essex : Elsevier Applied Science Publishers; 1992.

Meat science v. 32 (3): p. 307-310; 1992. Includes references.

Language: English

Descriptors: Pigs; Stress response; Slaughter; Blood chemistry

111 NAL Call. No.: SF89.H85 1991

Handling and loading of livestock.

Humane Slaughter Association (1986-); Agricultural Training Board Potters Bar, Herts. : Humane Slaughter Association,; 1991. 35 p. : ill. ; 15 x 21 cm.

Language: English

Descriptors: Animal welfare; Animals

112 NAL Call. No.: SF601.A47

Hazards in confinement housing--gases and dusts in confined animal houses for swine, poultry, horses and humans.

Pickrell, J.

Manhattan, Kan. : Kansas State University; 1991 Feb.

Veterinary and human toxicology v. 33 (1): p. 32-39; 1991 Feb. Includes references.

Language: English

Descriptors: Animal housing; Air pollutants

113 NAL Call. No.: SF601.C66

Health security: an increasing role for swine practitioners. Friendship, R.M.

Trenton, N.J. : Veterinary Learning Systems Company, Inc; 1992 Mar. The Compendium on continuing education for the practicing veterinarian v. 14 (3): p. 425-427; 1992 Mar. Includes references.

Language: English

Descriptors: North America; Pigs; Animal husbandry; Animal health; Swine diseases; Disease prevention; Disease control; Control programs; Veterinary services; Roles; Veterinarians

114 NAL Call. No.: 41.8 M69

Helping your clients raise healthy potbellied pigs.

Braun, W. Jr

Lenexa, Kan. : Veterinary Medicine Publishing Co; 1993 May05. Veterinary medicine v. 88 (5): p. 414, 418-419, 422-423, 426, 428; 1993 May05. Includes references.

Language: English

Descriptors: Miniature pigs; Animal health; Piglets; Animal husbandry; Pig feeding; Vaccination; Parasites; Zoonoses

115 NAL Call. No.: QL868.D6

Hormonal changes following an acute stress in control and somatostatin-immunized pigs.

Farmer, C.; Dubreuil, P.; Couture, Y.; Brazeau, P.; Petitclerc, D. Stoneham, Mass. : Butterworth-Heinemann; 1991 Oct.

Domestic animal endocrinology v. 8 (4): p. 527-536; 1991 Oct. Includes references.

Language: English

Descriptors: Pigs; Immunization; Somatostatin; Stress; Hormone secretion

116 NAL Call. No.: 58.8 J82

Human subjective response to lorry vibration: implications for farm animal transport.

Randall, J.M.

London : Academic Press; 1992 Aug.

Journal of agricultural engineering research v. 52 (4): p. 295-307; 1992 Aug. Includes references.

Language: English

Descriptors: Trucks; Drivers; Operator comfort; Vibration; Transport of animals; Animal welfare

Abstract: Lorry drivers are exposed to a wide range of mechanical vibrations and random motions. The seat and sometimes the cab suspensions are designed to reduce vibration exposure. Nevertheless drivers are often subjected to considerable discomfort occurring within minutes of starting a journey. The frequencies and axes of vibration which occur at a driver's seat are often close to those of maximum discomfort for the human. On

a livestock transporter, the interfaces between the animals and the vehicle are not designed to reduce vibration and it is possible that animals are subjected to a higher vibration magnitude than the driver. However, nothing is known of the discomfort or welfare levels experienced by livestock (e.g. cattle, sheep, pigs and poultry) during transport as the result of vibration and motion. This paper draws analogues with subjective evaluations of human comfort and poses a number of questions which must be addressed by research in order to quantify vibration dose, animal welfare response relationships. The primary requirement is to determine to what extent frequency dependent response weightings for the most important axes of vibration are necessary for each animal species and to determine how they should be defined. This would enable a comparison to be made between the experiences of humans and animals.

117 NAL Call. No.: 49 J82

Hypothalamic neurotransmitter concentrations and meat quality in stressed pigs offered excess dietary tryptophan and tyrosine.

Adeola, O.; Ball, R.O.

Champaign, Ill. : American Society of Animal Science; 1992 Jun.

Journal of animal science v. 70 (6): p. 1888-1894; 1992 Jun. Includes references.

Language: English

Descriptors: Pigs; Feed supplements; Tryptophan; Tyrosine; Serotonin; Catecholamines; Exudative meat; Pigmeat; Hypothalamus; Pig feeding; Stress

Abstract: Pale, soft, exudative (PSE) pork occurs, for the most part, from environmental stress on the pig. Amino acid intake may be related to stress susceptibility through hormone and neurotransmitter induction. Two experiments were conducted to determine whether supplementation of 5 g of tryptophan (TRP) or 10 g of tyrosine (TYR) per kilogram of a 14% CP diet would alter the response of pigs to stress as measured by hypothalamic neurotransmitter concentrations and incidence of PSE. Twenty-four (Exp. 1) and 36 (Exp. 2) 92-kg pigs were offered one of three diets: control, TRP-, or TYR-supplemented for 5 d before slaughter. Dietary TRP or TYR supplementation in Exp. 1. doubled ( $P < .05$ ) plasma TRP and TYR concentrations, respectively, and increased ( $P < .05$ ) 5-hydroxytryptamine, dihydroxyphenyl ethylamine, dihydroxyphenyl acetic acid, and homovanillic acid concentrations in the hypothalamus. Pigs that exhibited stress at slaughter had lower ( $P < .05$ ) hypothalamic concentrations of epinephrine, norepinephrine, and 5-hydroxytryptamine. In Exp. 2, pigs were trucked 55 km to a commercial meat packing facility and slaughtered without a rest period. This handling procedure was designed to invoke a high incidence of PSE pork and thus be a strong test of treatments. Supplemental dietary amino acids seemed to alter the frequency distribution of the severity of PSE pork. These data indicate that dietary manipulation of amino acid precursors of neurotransmitters may offer a practical means of reducing stress response in swine.

118 NAL Call. No.: QL750.A6

The identification of behavioural indicators of 'stress' in early weaned piglets.

Dybkjaer, L.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 Nov.

Applied animal behaviour science v. 35 (2): p. 135-147; 1992 Nov. Includes references.

Language: English

Descriptors: Piglets; Early weaning; Stress; Stress factors; Stocking density; Pig housing; Overcrowding; Abnormal behavior; Indicators

119 NAL Call. No.: 41.8 J82

Immunopathology in Aujeszky's disease virus-infected pigs exposed to fluctuating temperatures.

Narita, M.; Nanba, K.; Haritani, M.; Kawashima, K.

London : Academic Press; 1992 Aug.

Journal of comparative pathology v. 107 (2): p. 221-229; 1992 Aug. Includes references.

Language: English

Descriptors: Pigs; Aujeszky virus; Aujeszky's disease; Environmental temperature; Cyclic fluctuations; Stress; Disease resistance; Susceptibility; Pathology

120 NAL Call. No.: 49 J82

Impact of dietary tryptophan and behavioral type on behavior, plasma cortisol, and brain metabolites of young pigs.

Meunier-Salaun, M.C.; Monnier, M.; Colleaux, Y.; Seve, B.; Henry, Y. Champaign, Ill. : American Society of Animal Science; 1991 Sep. Journal of animal science v. 69 (9): p. 3689-3698; 1991 Sep. Includes references.

Language: English

Descriptors: Pigs; Tryptophan; Brain; Animal behavior; Dosage effects; Blood plasma; Amino acids; Fasting; Hydrocortisone

Abstract: The behavioral reactivity in an "open-field" test and plasma cortisol levels were studied in 72 pigs from 12 litters fed for 3 wk one of three diets with different levels of tryptophan: deficient (.14%), adequate (.23%), or excess (.32%). "Open-field" tests were performed three times: 5 d (day W + 5), 23 d (day W + 23) and 45 d (day W + 45) after weaning. The exploration time and the number of grunts provided an adequate measure of the individual emotional reactivity at day W + 5. Significant correlations were obtained between exploration time and the number of grunts at each time ( $r = -.83$  at day W + 5;  $r = -.46$  at day W + 23;  $r = -.71$  at day W + 45). The distinction between animals remained ( $P < .05$ ) in terms of exploration time at both 23 and 45 d after weaning. At day W + 23, exploration time was lower in the group fed the adequate diet than in the two other groups. This effect was maintained subsequently after feeding all pigs the same adequate diet (day W + 45). In 36 pigs slaughtered at day W + 23, brain TRP concentration was higher with the excess dietary TRP than with deficient or adequate levels. Conversely, other plasma amino acids (particularly threonine) accumulated only in the brains of pigs fed the deficient diet. Plasma cortisol level assayed at weaning (W) and 2 wk later increased with age and was higher in 16-h fasted (day W + 15) than in 3-h fasted (day W + 17) pigs. Correlations were observed within litters in the fasting state, between the cortisol level and behavioral traits measured at day W + 23 ( $r = .70$  for number of grunts,  $r = -.60$  for exploration time). Dietary TRP did not affect the plasma cortisol level irrespective of the nutritional state after weaning. However, an interaction was noted between plasma cortisol and TRP status ( $P < .05$ ). Although dietary TRP induced large variations in brain amino acids and 5-hydroxyindole concentrations, changes in behavioral and cortisol responses were relatively minor.

121 NAL Call. No.: 49 J82

Impact of dietary tryptophan and behavioral type on growth performance and plasma amino acids of young pigs.

Seve, B.; Meunier-Salaun, M.C.; Monnier, M.; Colleaux, Y.; Henry, Y. Champaign, Ill. : American Society of Animal Science; 1991 Sep. Journal of animal science v. 69 (9): p. 3679-3688; 1991 Sep. Includes references.

Language: English

Descriptors: Pigs; Tryptophan; Feed intake; Feed conversion; Animal behavior; Blood plasma; Amino acids; Fasting

Abstract: Tryptophan (TRP) content in the protein of the weaning diet was varied from deficient (.70 g/16 g N) to adequate (1.15 g/16 g N) and excess (1.60 g/16 g N) in diets fed to 108 pigs from d 5 to d 26 after weaning (W) and in 72 pigs from d 26 after weaning to slaughter (100 kg live weight) to assess immediate and long-term effects of TRP on performance. Daily weight gain and feed efficiency were improved when dietary TRP was increased from deficient to adequate (+60 and +40%, respectively). Concurrently, daily feed intake was elevated moderately (+15%). No further improvement was observed with excess TRP. In the low TRP group, gain/feed was significantly poorer up to 25 kg live weight, but this effect did not continue later. Although no compensatory growth could be shown in the group fed the deficient diet, growth retardation was very small (1.5%;  $P > .10$ ) at slaughter. Early changes in TRP supply did not affect either carcass or meat quality. Behavioral reactivity, as determined on day W + 5 in an "open-field" test, did not affect early performance, but growth rate during the growing-finishing stage (3.2%) or the whole period (2.5%) was greater by nonemotional than by emotional pigs. Plasma amino acid contents in blood samples, withdrawn on day W + 15 (fed state) and W + 17 (fasted state), were consistent with the effect of TRP on growth rates. However, in the fasted state, a diet X reactivity interaction suggested that TRP removal from the plasma was less rapid in nonemotional than in emotional pigs. Furthermore, increased plasma concentrations of essential amino acids and urea in the latter group suggested that protein and amino acid catabolism was more rapid in emotional than in nonemotional pigs. These data are discussed relative to the effect of the behavioral type of pig on its TRP requirement.

122 NAL Call. No.: 275.29 ID13IDC

Improve pork quality reduce PSE and other defects.

Boggess, M.V.

Moscow, Idaho : The Service; 1992 Feb.

Current information series - Cooperative Extension Service, University of Idaho (918): 4 p.; 1992 Feb.

Language: English

Descriptors: Pigmeat; Exudative meat; Meat quality; Pigs; Porcine stress syndrome; Slaughter

123 NAL Call. No.: SF601.B6

Increasing the survivability of neonatal pigs.

Appelgate, J.

Santa Barbara, Calif. : Veterinary Practice Publishing Company; 1992 Mar. Agri-Practice v. 13 (3): p. 27-30; 1992 Mar. Includes references.

Language: English

Descriptors: Pennsylvania; Pigs; Newborn animals; Survival; Colostrum; Sows; Antibody formation; Vaccination; Early weaning; Disease prevention

124 NAL Call. No.: QL750.A6

Individual differences in behavioural responses of pigs exposed to non-social and social challenges.

Lawrence, A.B.; Terlouw, E.M.C.; Illius, A.W.

Amsterdam : Elsevier Science Publishers, B.V.; 1991 Apr.

Applied animal behaviour science v. 30 (1/2): p. 73-86; 1991 Apr. Includes references.

Language: English

Descriptors: Gilts; Treatment; Handling; Temperament; Animal behavior; Individual characteristics

125 NAL Call. No.: SF395.P62

Individual mating facilities for swine.

Singleton, W.; Levis, D.

West Lafayette, Ind. : Cooperative Extension Service, Purdue University, [1978?-1990]; 1992.

Pork industry handbook. 7 p.; 1992. In the subseries: Housing. (PIH-69), revised June 1992.

Language: English

Descriptors: U.S.A.; Pigs; Pig housing; Mating; Boars; Sows; Temperature; Building construction

126 NAL Call. No.: SF601.C24

The influence of age and health status on the serum alpha 1-acid glycoprotein level of conventional and specific pathogen-free pigs. Itoh, H.; Tamura, K.; Izumi, M.; Motoi, Y.; Kidoguchi, K.; Funayama, Y. Ottawa : Canadian Veterinary Medical Association; 1993 Apr. Canadian journal of veterinary research; Revue canadienne de recherche veterinaire v. 57 (2): p. 74-78; 1993 Apr. Includes references.

Language: English

Descriptors: Pigs; Blood serum; Glycoproteins; Pneumonia; Swine diseases; Spf husbandry; Immune response; Age differences; Immune serum; Lungs; Lesions; Normal values

127 NAL Call. No.: QL750.A6

The influence of conditions at the time of mating on reproduction of commercial pigs.

Hemsworth, P.H.; Hansen, C.; Coleman, G.J.; Jongman, E. Amsterdam : Elsevier Science Publishers, B.V.; 1991 May. Applied animal behaviour science v. 30 (3/4): p. 273-285; 1991 May. Includes references.

Language: English

Descriptors: Pigs; Sexual behavior; Litter size; Mating systems; Farrowing rate; Female fertility; Fecundity

128 NAL Call. No.: QL750.A6

Influence of parity and time since parturition on responsiveness of sows to a piglet distress call.

Hutson, G.D.; Argent, M.F.; Dickenson, L.G.; Luxford, B.G. Amsterdam : Elsevier Science Publishers, B.V.; 1992 Sep. Applied animal behaviour science v. 34 (4): p. 303-313; 1992 Sep. Includes references.

Language: English

Descriptors: Sows; Piglets; Vocalization; Parous rates; Postpartum interval; Time; Responses; Maternal behavior

129 NAL Call. No.: QL750.A6

The influence of pen size on toy preference of growing pigs. Apple, J.K.; Craig, J.V.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 Nov. Applied animal behaviour science v. 35 (2): p. 149-155; 1992 Nov. Includes references.

Language: English

Descriptors: Gilts; Pig housing; Pens; Stocking density; Toys; Play; Stress; Abnormal behavior

130 NAL Call. No.: QL750.A6

Influence of the sexual motivation of the boar on the sexual partner preferences of oestrous gilts.

Hemsworth, P.H.; Price, E.O.; Tilbrook, A.J.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 May.

Applied animal behaviour science v. 33 (2/3): p. 209-215; 1992 May. Includes references.

Language: English

Descriptors: Boars; Gills; Mating preferences; Sexual behavior; Estrus

131 NAL Call. No.: 410 B77

Influences of feeding level and physical restriction on development of stereotypies in sows.

Terlouw, E.M.C.; Lawrence, A.B.; Illisu, A.W.

London : Academic Press; 1991 Dec.

Animal behaviour v. 42 (pt.6): p. 981-991; 1991 Dec. Includes references.

Language: English

Descriptors: Sows; Behavior patterns; Environmental factors; Restraint of animals; Restricted feeding

Abstract: In attempting to understand the mechanisms underlying the development of stereotypic behaviour patterns it is important to determine those environmental factors that contribute to the development of such behaviour. The effects of restraint and food restriction on the development of stereotypies in pregnant nulliparous sows, *Sus scrofa*, were investigated. In the two housing conditions used in the present study, food restriction, but not restraint, was a major factor in increased levels of activity and in particular high levels of drinking and chain manipulation. Food-restricted sows also increased their feeding rate significantly over the experimental period. Restrained sows spent more time in behaviour such as standing inactive and sham chewing that did not involve manipulation or exploration of substrates. Hughes & Duncan (1988. *Anim. Behav.*, 36, 1696-1707) proposed that stereotypies result from long-term performance of elements of appetitive behaviour. Their model suggests that, in the present study, stereotypies resulted from both environments preventing the animal proceeding to the consummatory phase of foraging behaviour and 'switching off' the underlying motivation. This explanation, however, is not consistent with the observation that time spent in appetitive behaviour did not decrease as the level of stereotypy increased, and that stereotypies were concentrated in the post-feeding period. It is also not consistent with the high levels of drinking and chewing of substrates that the food-restricted sows developed, as these activities appear to be more closely related to consummatory behaviour than to appetitive behaviour. It is concluded that there remain a number of aspects of stereotypies in pigs and other species that cannot be wholly explained by current models.

132 NAL Call. No.: QL750.A6

Influences of intermittent daily draught on the behaviour of weaned pigs. Scheepens, C.J.M.; Hessing, M.J.C.;

Laarakker, E.; Schouten, W.G.P.; Tielen, M.J.M.

Amsterdam : Elsevier Science Publishers, B.V.; 1991 Jul. Applied animal behaviour science v. 31 (1/2): p.

69-82; 1991 Jul. Includes references.

Language: English

Descriptors: Pigs; Animal behavior; Cold stress; Climatic factors

133 NAL Call. No.: 49 J82

The interrelationship between crude protein and exogenous porcine somatotropin on growth, feed and carcass measurements of pigs.

Smith, V.G.; Kasson, C.W.

Champaign, Ill. : American Society of Animal Science; 1991 Feb.

Journal of animal science v. 69 (2): p. 571-577; 1991 Feb. Includes references.

Language: English

Descriptors: Pigs; Somatotropin; Protein intake; Growth rate; Gastric ulcer; Feed conversion efficiency; Backfat; Fat thickness; Pituitary; Weight; Dosage effects; Feed intake

Abstract: In three experiments the interrelationship between dietary CP and recombinant porcine somatotropin (rpSt, i.m. daily) on ADG, feed efficiency (F/G) and carcass traits was examined in crossbred Yorkshire gilts and barrows given ad libitum access to their diets during the finishing period (55 to 110 kg BW). Pigs, blocked by BW and gender, were assigned (four/pen) within block. In Exp. 1, 140 pigs were assigned two/gender per pen to each of five pens/block and received a diet of either 12%, 18% or 24% CP (n = 2, 1 and 2 pens/block, respectively). Pigs received rpSt, either 0 or 120 microgram/kg BW (12% and 24% CP groups) or 60 microgram/kg BW (18% CP group). When CP was 12%, rpSt decreased ADG and increased F/G (P < .05), whereas when CP was 18% or 24%, rpSt increased ADG and lowered F/G (P < .05). Backfat thickness was reduced (P < .05) by rpSt regardless of CP. In Exp. 2, 120 pigs were assigned two/gender per pen to each of five pens/block and received a diet of 24% CP. Either 0, 15, 30, 60 or 120 microgram of rpSt/kg BW was administered to each pig. All doses of rpSt increased ADG, lowered F/G and decreased backfat thickness compared with measurements for control pigs (P < .05). In Exp. 3, 140 pigs were assigned two/gender per pen to each of seven pens/block and received a diet of either 14%, 18% or 24% CP (n = 3, 2 and 2 pens/block, respectively). Pigs received rpSt at either 0, 15 or 60 microgram/kg BW (14% CP group) or at 15 or 60 microgram/kg BW (18% and 24% CP groups). When CP was 14%, 15 microgram of rpSt/kg BW affected neither ADG nor F/G (P > .05), but 60 microgram of rpSt/kg BW decreased ADG (P < .05). When CP was 18% or 24%, rpSt at 15 or at 60 microgram/kg BW increased ADG and lowered F/G (P < .05) compared to the 14% CP control pigs. Backfat thickness was reduced (P < .05) by rpSt regardless of CP. During all experiments, stomach ulcers developed (P < .05) in pigs treated with 60 or 120 microgram of rpSt/kg BW. We concluded that dietary CP has to be gr

134 NAL Call. No.: 280.8 SY8

Is Monsanto burning money in its biotech barn?.

Siler, J.F.; Crey, J.

New York, N.Y. : McGraw-Hill .:; 1991 Sep02.

Business week (3229): p. 74-75; 1991 Sep02.

Language: English

Descriptors: Somatotropin; Genetic engineering; Milk production; Pigmeat; Research support; Product development

135 NAL Call. No.: BJ52.5.J68

It is morally permissible to manipulate the genome of domestic hogs. Blatz, C.V.

Guelph, Ontario, Canada : University of Guelph; 1991.

Journal of agricultural & environmental ethics v. 4 (2): p. 166-176; 1991. Includes references.

Language: English

Descriptors: Pigs; Genetic engineering; Animal welfare; Ethics; Biotechnology; Transgenics

136 NAL Call. No.: QH324.C7

Lipid composition and thermotropic phase behavior of boar, bull, stallion, and rooster sperm membranes.

Parks, J.E.; Lynch, D.V.

Orlando, Fla. : Academic Press; 1992 Apr.

Cryobiology v. 29 (2): p. 255-266; 1992 Apr. Includes references.

Language: English

Descriptors: Boars; Bulls; Cocks; Stallions; Spermatozoa; Plasma membranes; Protein content; Lipids; Susceptibility; Cold shock; Motility; Temperature

137 NAL Call. No.: SF395.W463 1992

Lord Emsworth's annotated Whiffle The care of the pig.. Care of the pig Whiffle, Augustus; Hogg, James

New York : Heineman,; 1992.

xi, 128 p. : ill. ; 23 cm.

Language: English; English

Descriptors: Swine; Swine

138 NAL Call. No.: 470 SCI2

Malignant hyperthermia.

MacLennan, D.H.; Phillips, M.S.

Washington, D.C. : American Association for the Advancement of Science; 1992 May08.

Science v. 256 (5028): p. 789-794; 1992 May08. Includes references.

Language: English

Descriptors: Porcine stress syndrome; Genetic analysis

Abstract: In humans genetically predisposed to malignant hyperthermia, anesthesia can induce skeletal muscle rigidity, hypermetabolism, and high fever, which, if not immediately reversed, can lead to tissue damage or death. The corresponding condition in swine leads to stress-induced deaths and devalued meat products.

Abnormalities in the Ca<sup>2+</sup> release channel of skeletal muscle sarcoplasmic reticulum (the ryanodine receptor) have been implicated in the cause of both the porcine and human syndromes by physiological and biochemical studies and genetic linkage analysis. In swine, a single founder mutation in the ryanodine receptor gene (RYR1) can account for all cases of malignant hyperthermia in all breeds, but a series of different RYR1 mutations are likely to be uncovered in human families with MH. Moreover, lack of linkage between malignant hyperthermia and RYR1 in some families indicates a heterogenous genetic basis for the human syndrome.

139 NAL Call. No.: S544.3.O5O5

Management and nutrition of the bred gilt and sow.

Luce, W.G.; Maxwell, C.V.

Stillwater, Okla. : The Service; 1991 Nov.

OSU extension facts - Cooperative Extension Service, Oklahoma State University v.): 4 p.; 1991 Nov.

Includes references.

Language: English

Descriptors: Sows; Gilts; Pig farming; Breeding; Heat stress; Nutrition; Supplementary feeding; Feed additives; Feed dispensers; Disease control

140 NAL Call. No.: SF395.P62

Management and nutrition of the newly weaned pig.

Aherne, F.; Hogberg, M.G.; Kornegay, E.T.; Shurson, G.C. West Lafayette, Ind. : Cooperative Extension Service, Purdue University, [1978?-1990]; 1992.

Pork industry handbook. 4 p.; 1992. In subseries: Management (PIH-111), revised December 1992.

Language: English

Descriptors: Piglets; Piglet feeding; Weaning; Age at weaning; Weaning weight; Early weaning; Pig housing

141 NAL Call. No.: S544.3.O5O5

Management of growing-finishing swine.

Luce, W.G.; Huhnke, R.L.

Stillwater, Okla. : The Service; 1991 Aug.

OSU extension facts - Cooperative Extension Service, Oklahoma State University (3654): 6 p.; 1991 Aug.

Language: English

Descriptors: Pigs; Pig fattening; Pig housing; Pig feeding; Disease control; Parasites; Insecticides; Dry lot feeding; Pastures

142 NAL Call. No.: 275.29 G29B

Management of young pigs.

Jones, R.

Athens, Ga. : The Service; 1991 Dec.

Bulletin - Cooperative Extension Service, University of Georgia, College of Agriculture v.): 14 p. ill; 1991 Dec.

Language: English

Descriptors: Pigs; Animal husbandry; Piglet production

143 NAL Call. No.: 41.8 M69

Managing and feeding sows for optimum productivity.

Tubbs, R.C.

Lenexa, Kan. : Veterinary Medicine Publishing Co; 1992 Oct. Veterinary medicine v. 87 (10): p. 1048-1056; 1992 Oct. Includes references.

Language: English

Descriptors: Gilts; Sows; Sow feeding; Animal husbandry; Productivity; Nutrient intake; Plane of nutrition

144 NAL Call. No.: S544.3.O5O5

Managing the herd boar.

Luce, W.G.

Stillwater, Okla. : The Service; 1991 Sep.

OSU extension facts - Cooperative Extension Service, Oklahoma State University v.): 4 p.; 1991 Sep.

Language: English

Descriptors: Boars; Mating ability; Mating behavior; Semen production; Boar feeding; Pig housing; Breeding methods

145 NAL Call. No.: QL750.J68

Maternal behaviour in sows of different social rank.

Csermely, D.; Nicosia, E.

Kyoto, Japan : Japan Ethological Society; 1991.

Journal of ethology v. 9 (2): p. 83-93; 1991. Includes references.

Language: English

Descriptors: Sows; Maternal behavior; Social structure; Sow lactation

146 NAL Call. No.: S671.A66

Mechanical backup systems for electronic environmental controllers. Gates, R.S.; Overhults, D.G.; Turner, L.W.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1992 Jul. Applied engineering in agriculture v. 8 (4): p. 491-497; 1992 Jul. Includes references.

Language: English

Descriptors: Environmental control; Controllers; Pig housing; Poultry housing

Abstract: A series of mechanical backup systems for electronic environmental controllers is presented for a typical finishing swine barn and a typical tunnel ventilated broiler house. The systems consist of mechanical thermostats and timers used in parallel with the electronic controller, designed to ensure animal survival in the event of controller or related hardware failure. For swine housing, three distinct mechanical backup functions are identified; for broiler housing, four distinct mechanical backup functions are identified. Schematic diagrams of the mechanical backup functions are provided and their implementation is described.

147 NAL Call. No.: SF393.M55S76 1992

Miniature pigs everything about purchase, care, nutrition, breeding, behavior, and training.

Storer, Pat; Storer, Kristin

New York : Barron's.; 1992.

88 p. : ill. (some col.) ; 20 cm. Includes index.

Language: English

Descriptors: Miniature swine as pets

148 NAL Call. No.: QL55.A1L33

Miniature swine in biomedical research: applications and husbandry considerations.

Fisher, T.F.

New York, N.Y. : Nature Publishing Company; 1993 May.

Lab animal v. 22 (5): p. 47-50; 1993 May. Includes references.

Language: English

Descriptors: Miniature pigs; Animal husbandry; Applications

149 NAL Call. No.: 58.8 J82

A model of the dynamic thermal environment in livestock buildings. Zhang, Y.; Barber, E.M.; Sokhansanj, S. London : Academic Press; 1992 Oct.

Journal of agricultural engineering research v. 53 (2): p. 103-122; 1992 Oct. Includes references.

Language: English

Descriptors: Farrowing houses; Heating systems; Artificial ventilation; Environmental temperature; Dynamics; Equipment; Systems; Control; Simulation models; Mathematical models

Abstract: An understanding of the dynamics of the thermal environment in heated and ventilated spaces is needed for the selection of optimized equipment systems and control strategies. A simulation model is presented which describes the transient thermal responses within a ventilated livestock building. First, a mathematical model of heat and mass transfer within the airspace was tested for a single heating and cooling event using data from a laboratory chamber and from a pig farrowing room. This model was limited by a need for a better estimate of the convective heat transfer coefficients at the inside surfaces of the building shell. A further limitation was the complexity needed to simulate the rapid changes in pressure that occur in response to sudden temperature changes and, therefore, an inability to simulate accurately the exhaust air flow delivered by propellor fans. The airspace heat and mass transfer model was coupled with a model of an electromechanical temperature controller and the overall model was used to simulate a series of heating and cooling events within a pig farrowing room. The GASP IV simulation software was used because of the facility with which both discrete and continuous events can be modelled. Although the simulated temperature did not agree exactly over a 24h period with real temperature data, the fit was sufficiently good to conclude that the simulation model is useful for analysing alternative control strategies for livestock building heating and ventilating systems.

150 NAL Call. No.: 290.9 AM32T

Modeling eating behavior of growing-finishing swine.

McDonald, T.P.; Nienaber, J.A.; Chen, Y.R.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1991 Mar. Transactions of the ASAE v. 34 (2): p. 591-596; 1991 Mar. Includes references.

Language: English

Descriptors: Pig feeding; Feed intake; Feeding behavior; Markov processes; Mathematical models

Abstract: A model was developed to predict the dynamic eating behavior of swine. The model employed a Markov chain to describe the sequence of eating and not eating behavioral events. Theoretical implications of assuming the Markov model on specific eating characteristics were developed, and these results were compared to data obtained from observation of three growing-finishing swine. Results showed that the model could predict the eating behavior of growing-finishing swine in an average sense, but could not accurately reproduce the distribution of meal lengths. This was due to the preference of the animals for meals lasting a specific length of time, a result the model could not account for.

151 NAL Call. No.: 290.9 AM32T

Modelling newborn piglet thermal interactions with a surface energy balance model.

Hoff, S.J.; Janni, K.A.; Jacobson, L.D.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1993 Jan. Transactions of the ASAE v. 36

(1): p. 151-159; 1993 Jan. Includes references.

Language: English

Descriptors: Piglets; Newborn animals; Body heat loss; Farrowing houses; Interactions; Mathematical models; Relative humidity; Temperature

Abstract: A mathematical model was developed to describe the radiative and convective thermal interactions between a newborn piglet and its surroundings. The model incorporates surface energy balances for each surface in the enclosure. The model was verified with results from a simulated creep area and from published calorimetric studies on newborn pigs. Mathematical results were all within 5.5% of the measured results from a simulated creep-area. Compared with published studies, the mathematical model over-predicts heat loss in high-demand environments and under predicts heat loss in low-demand environments.

152 NAL Call. No.: QL750.A6

Modifications in the aggressive and ingestive behavior of the neonatal piglet as a result of prenatal elevation of cortisol in the dam. Bate, L.A.

Amsterdam : Elsevier Science Publishers, B.V.; 1991 May. Applied animal behaviour science v. 30 (3/4): p. 299-306; 1991 May. Includes references.

Language: English

Descriptors: Piglets; Newborn animals; Aggressive behavior; Hydrocortisone; Corticotropin; Suckling; Sows; Prenatal period

153 NAL Call. No.: 410 B77

Nest building in domestic sows: the role of external stimuli. Jensen, P.

London : Academic Press; 1993 Feb.

Animal behaviour v. 45 (pt.2): p. 351-358; 1993 Feb. Includes references.

Language: English

Descriptors: Sows; Nesting

Abstract: To study the role of external stimuli in triggering and controlling nest building, 12 domestic sows, *Sus scrofa*, were randomly selected for farrowing in one of two environments. Six sows were kept in pens measuring 2.5 X 3 m enriched with a soil bed and a straw rack ('rich' situation), and six were kept in identically shaped pens with no soil or straw ('poor' situation). Their behaviour was videotaped during the 48 h preceding farrowing. No significant differences between the situations were found with regard to the total frequencies of nesting behaviour. The relative frequencies of behaviour patterns mainly performed at the beginning of the nesting period (nosing and rooting) were significantly higher in the poor environment, while those mainly performed later during nesting (carrying material, arranging) were more frequent in the rich environment. No signs of vacuum gathering and carrying and only a few instances of vacuum arranging were recorded in the poor environment. A factor analysis of the behaviour in the rich situation suggested the existence of two different clusters of behaviour patterns, associated with either a 'preparation factor' (standing, nosing and rooting) or a 'nest material factor' (walking, carrying material and arranging). The findings support a model for the control of nesting in sows with a first part of preparation of the nest site, largely triggered by internal factors, and a second part of gathering and arranging nest material, largely dependent on external stimuli.

154 NAL Call. No.: QH324.C7

New thermal test to assess the viability of cryopreserved boar sperm. Fisher, P.S.; Hansen, C.; Underhill, L.; Marcus, G.J.  
Orlando, Fla. : Academic Press; 1991 Oct.  
Cryobiology v. 28 (5): p. 454-459; 1991 Oct. Includes references.

Language: English

Descriptors: Boars; Spermatozoa; Cryopreservation; Heat stress; Rapid methods; Tests; Viability

155 NAL Call. No.: S590.S68

Nitrate leaching and intensive outdoor pig production. Worthington, T.R.; Danks, P.W.  
Oxford : Blackwell Scientific Publications; 1992 Jun.  
Soil use and management v. 8 (2): p. 56-60; 1992 Jun. Includes references.

Language: English

Descriptors: Uk; Pig farming; Nitrate; Leaching; Losses from soil; Nitrogen cycle; Water pollution; Legislation

Abstract: The production of pigs in outdoor units is gaining in popularity in the United Kingdom and is often concentrated on free-draining soils over important aquifers. Originally, stocking rates were sufficiently low to ensure the maintenance of a grass crop, but recently they have increased. Pigs are natural 'rooters' and wallowers and so cause damage to vegetation and soil structure. With overstocking these natural activities lead to considerable areas of bare, uncropped ground for much of the year. This paper assesses the potential for leaching of nitrate from such land, and makes recommendations for decreasing it.

156 NAL Call. No.: QL750.A6

A non-invasive telemetry system for obtaining heart rate from free-ranging swine.  
Friend, T.H.; Dellmeier, G.R.; Stuart, J.L.  
Amsterdam : Elsevier Science Publishers, B.V.; 1991 Feb.  
Applied animal behaviour science. p. 343-348; 1991 Feb. Paper presented at the "Conference on Ungulate Behavior and Management," May 23-27, 1988, College Station, Texas. Includes references.

Language: English

Descriptors: Sows; Telemetry; Heart rate

157 NAL Call. No.: 49 AN55

A note of hunger in the pig: sows on restricted rations will sustain an energy deficit to gain additional food.  
Hutson, G.D.  
East Lothian, Scotland : Durrant; 1991 Feb.  
Animal production v. 52 (pt.1): p. 233-235; 1991 Feb. Includes references.

Language: English

Descriptors: Sows; Restricted feeding; Hunger; Conditioning; Animal welfare

158 NAL Call. No.: 49 AN55

A note on the development of behaviour of intensively managed piglets in the humid tropics.

Kabuga, J.D.; Annor, S.Y.  
East Lothian, Scotland : Durrant; 1992 Feb.  
Animal production v. 54 (pt.1): p. 157-159; 1992 Feb. Includes references.

Language: English

Descriptors: Piglets; Humid tropics; Intensive livestock farming; Animal behavior; Age differences; Time

159 NAL Call. No.: 49 AN55

A note on the effects of environmental temperature on live-weight gain during fattening of pigs.  
Sakai, T.; Nishino, M.; Hamakawa, M.; Yoon, C.S.; Thirapatsakun, T. East Lothian, Scotland : Durrant; 1992 Feb.  
Animal production v. 54 (pt.1): p. 147-149; 1992 Feb. Includes references.

Language: English

Descriptors: Pigs; Pig fattening; Environmental temperature; Liveweight gain; Pig housing

160 NAL Call. No.: 49 AN55

A note on the IVOG-station: a feeding station to record the individual food intake of group-housed growing pigs.  
Haer, L.C.M. de; Merks, J.W.M.; Kooper, H.G.; Buiting, G.A.J.; Hattum, J.A. van  
East Lothian, Scotland : Durrant; 1992 Feb.  
Animal production v. 54 (pt.1): p. 160-162; 1992 Feb. Includes references.

Language: English

Descriptors: Pigs; Feed intake; Feeding behavior; Recording; Equipment; Feed dispensers

161 NAL Call. No.: QL750.A6

Oestrus detection in group-housed sows by analysis of data on visits to the boar.  
Bressers, H.P.M.; Te Brake, J.H.A.; Noordhuizen, J.P.T.M. Amsterdam : Elsevier Science Publishers, B.V.; 1991 Aug. Applied animal behaviour science v. 31 (3/4): p. 183-193; 1991 Aug. Includes references.

Language: English

Descriptors: Sows; Boars; Estrus; Detection; Groups; Pig housing; Prediction; Standing reflex

162 NAL Call. No.: QH540.S8

Olfactometric characterization of odour generation potential of pigery manure samples.  
Wassenhove, F. van; Vanrolleghem, P.; Langenhove, H. van; Verstraete, W. Amsterdam : Elsevier Science Publishing B.V.; 1992.  
Studies in environmental science (51): p. 425-430; 1992. In the series analytic: Biotechniques for air pollution abatement and odour control policies / edited by A.J. Dragt and J. van Ham. Proceedings of an International Symposium, October 27-29, 1991, Maastricht, The Netherlands. Includes references.

Language: English

Descriptors: Pig manure; Odors; Air pollution; Odor emission; Pig housing; Olfactometers

163 NAL Call. No.: S494.5.D3C652

An open information system for the swine production and marketing industry: its scope, topology and telecommunication strategy.

Groeneveld, E.; Lacher, P.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 Jul. Computers and electronics in agriculture v. 7 (2): p. 163-185; 1992 Jul. Includes references.

Language: English

Descriptors: Pigs; Meat and livestock industry; Animal production; Information needs; Information systems; Computer software; Marketing; Record keeping; Classification; Telecommunications; Animal husbandry

164 NAL Call. No.: QL750.A6

Operant technology applied to solving farm animal problems. An assessment. Kilgour, R.; Foster, T.M.; Temple, W.; Matthews, L.R.; Bremner, K.J. Amsterdam : Elsevier Science Publishers, B.V.; 1991 Apr. Applied animal behaviour science v. 30 (1/2): p. 141-166; 1991 Apr. Bibliography. Literature review.

Language: English

Descriptors: New Zealand; Animal behavior; Animal experiments; Conditioning; Perception; Cattle; Dogs; Goats; Hens; Horses; Pigs; Sheep; Bibliographies; Literature reviews; Responses; Stimuli; Feeding preferences

165 NAL Call. No.: 290.9 AM32T

An optimal misting method for cooling livestock housing. Gates, R.S.; Usry, J.L.; Nienaber, J.A.; Turner, L.W.; Bridges, T.C. St. Joseph, Mich. : American Society of Agricultural Engineers; 1991 Sep. Transactions of the ASAE v. 34 (5): p. 2199-2206; 1991 Sep. Literature review. Includes references.

Language: English

Descriptors: Pig housing; Cooling; Evaporative cooling; Mists; Literature reviews; Mathematical models

Abstract: A method to analyze the operation of misting systems to cool livestock housing by minimizing interior Temperature-humidity Index (THI) is presented. The procedure is shown to be similar to the analysis for evaporative pad cooling, except that interior maximum relative humidity is specified instead of pad efficiency. The minimization of THI is shown to be equivalent to the minimization of interior dry-bulb temperature. If interior heat and moisture loads are neglected, the interior state point can be found at an intersection of outside wet-bulb temperature and inside maximum relative humidity; implications of neglecting these loads are quantified. Comparisons between no cooling, pad cooling, and misting are made to the resultant interior dry-bulb temperature, and to the Gain Reduction Factor (Morrison et al., 1968), for the simplified assumptions of no internal heat loads. The misting system is shown to compare favorably with evaporative pad cooling.

166 NAL Call. No.: S671.A66

Parametric design with associated costs and production data of swine nurseries.

Helmink, K.J.; Christianson, L.L.; Riskowski, G.L.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1991 Mar. Applied engineering in agriculture v. 7 (2): p. 237-247; 1991 Mar. Includes references.

Language: English

Descriptors: Pig housing; Ventilation; Design; Costs; Parametric programming; Computer software

Abstract: The Illinois Nursery Improvement Software (INIS) is a computerized, parametric design aid for swine nurseries and prenurseries. INIS prepares plan and elevation drawings, specifies equipment and materials and compares ventilation options. Costs of alternative ventilation systems are calculated. Users can estimate productivity improvements (feed efficiency, health costs, gain rates, and mortality rates) that will result from improved ventilation to compare with ventilation system costs.

167 NAL Call. No.: 49 AN55

Patterns of daily food intake in growing pigs.

Haer, L.C.M. de; Merks, J.W.M.

East Lothian, Scotland : Durrant; 1992 Feb.

Animal production v. 54 (pt.1): p. 95-104; 1992 Feb. Includes references.

Language: English

Descriptors: Pigs; Feed intake; Unrestricted feeding; Feeding behavior; Meal patterns; Group size; Individual feeding; Pig feeding

168 NAL Call. No.: 49 J82

The performance and carcass composition responses of finishing swine to a range of porcine somatotropin doses in a 1-week delivery system. Knight, C.D.; Kasser, T.R.; Swenson, G.H.; Hintz, R.L.; Azain, M.J.; Bates, R.O.; Cline, T.R.; Crenshaw, J.D.; Cromwell, G.L.; Hedrick, H.B. Champaign, Ill. : American Society of Animal Science; 1991 Dec. Journal of animal science v. 69 (12): p. 4678-4689; 1991 Dec. Includes references.

Language: English

Descriptors: Pigs; Somatotropin; Carcass composition; Dosage effects; Liveweight gain; Feed conversion; Protein intake; Pigmeat; Shear strength; Sex differences

Abstract: Four experiments using 580 barrows and 580 gilts (Study 1) and seven experiments using 500 barrows and 500 gilts (Study 2) were conducted at various geographical locations in the United States to determine the dose response of a pelleted form of porcine somatotropin (pST) relative to ADG, feed/gain (F/G), and percentage of carcass protein. Average initial weights for Studies 1 and 2 were 67.6 and 72.6 kg, respectively, and four pigs/pen were slaughtered when they achieved weights of 106.5 to 111.0 kg. In Study 1, pigs were implanted subcutaneously with pelleted pST doses of 0, 12, 24, 36, or 48 mg/wk and self-fed a corn-soybean meal diet containing 13.75% CP. Study 2 included two control groups self-fed a diet containing either 13.75 or 17% CP with added lysine. The pST-treated pigs were administered 12, 24, or 36 mg/wk, and all were offered the 17% CP diet. The pST treatments in Study 1 resulted in a linear reduction ( $P < .05$ ) in average daily feed intake (ADFI) and a quadratic ( $P < .05$ ) improvement in F/G and percentage of carcass protein. The pST treatments in Study 2 resulted in a linear reduction in ADFI ( $P < .05$ ), a linear improvement in F/G, and a quadratic increase in the percentage of carcass protein ( $P < .05$ ). Average daily gain was not affected in either study with this form of pST. The greatest increase in efficiency of lean gain was observed with the 36-mg dose for both Study 1 (9.4%) and Study 2 (10.8%). In Study 1, the force required to shear cores of the longissimus muscle was increased linearly with pST treatment ( $P < .05$ ). There was a similar linear increase in Study 2 with pST treatment ( $P < .05$ ); however, there was also an effect of sex ( $P < .05$ ) on shear force (gilts > barrows) that was similar in magnitude to that observed for pST treatment. Differences in sensory evaluation because of pST were minor and of the same magnitude as those observed between barrows

and gilts. It was therefore concluded that weekly administration of pST improved F/G

169 NAL Call. No.: 41.8 AM3

Performance measured in pigs with pneumonia and housed in different environments.

Straw, B.E.

Schaumburg, Ill. : The Association; 1991 Feb15.

Journal of the American Veterinary Medical Association v. 198 (4): p. 627-630; 1991 Feb15. Includes references.

Language: English

Descriptors: Pigs; Pig housing; Pneumonia; Growth rate; Liveweight gain; Feed conversion efficiency; Lesions; Actinobacillus pleuropneumoniae; Mycoplasma hyopneumoniae

170 NAL Call. No.: 49 J82

The performance of gilts in a new group housing system: endocrinological and immunological functions.

Von Borell, E.; Morris, J.R.; Hurnik, J.F.; Mallard, B.A.; Buhr, M.M. Champaign, Ill. : American Society of Animal Science; 1992 Sep. Journal of animal science v. 70 (9): p. 2714-2721; 1992 Sep. Includes references.

Language: English

Descriptors: Gilts; Pig housing; Group size; Blood plasma; Progesterone; Adrenal glands; Diagnostic techniques; Immune response; Reproductive performance; Body weight; Backfat; Litter weight; Hydrocortisone

Abstract: The effect of a new group housing system on performance (132 gilts and litters) and endocrinological (35 gilts) and immunological functions (28 gilts) was studied. Animals were randomly assigned to a conventional system control, involving > 2 mo in individual stalls, or to the Hurnik-Morris (H-M) housing system, involving continuous housing in small groups, for breeding-gestating swine. The gilts were reared throughout gestation in their respective housing systems and moved 3 to 5 d preparturition to a common farrowing facility. Various production data were collected, including sow weight and backfat measurements, number of pigs born, number born alive, number weaned, litter birth weight, and litter weaning weight. An adrenal function test using dexamethasone pretreatment and ACTH1-24 challenge was imposed on gilts 5 d prebreeding and once between d 81 to 87 of gestation. Plasma progesterone was measured at the same time. Immune function was measured by serum antibody response to hen egg white lysozyme (HEWL) and delayed-type hypersensitivity (DTH) to tuberculin. Gilts reared in the H-M housing system exhibited a number of pigs weaned per litter and litter weaning weights comparable to the number and weights in the control system (7.3 +/- .33 vs 6.9 +/- .38, P = .421 and 56.9 +/- 2.42 kg vs 51.3 +/- 2.76 kg, P = .132, respectively). Prefarrowing and weaning backfat measurements were significantly reduced in group-housed gilts (15.8 +/- .45 mm vs 17.8 +/- .55 mm, P = .005 and 14.6 +/- .4 mm vs 16.2 +/- .42 mm, P = .008, respectively). Adrenocortical function and plasma progesterone were not different between gilts in different housing systems. Antibody response to HEWL and inflammatory response was numerically but not significantly greater for gilts reared in the H-M housing system than for those in the control system. The results of this study provided encouragement for the development of group housing without compromising production or endocrinological and immunological

171 NAL Call. No.: QL750.A6

The peri-parturient behaviour of sows housed in pairs. Arey, D.S.; Petchey, A.M.; Fowler, V.R.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 Jul. Applied animal behaviour science v. 34 (1/2): p.

49-59; 1992 Jul. Includes references.

Language: English

Descriptors: Sows; Group behavior; Farrowing; Reproductive behavior; Aggressive behavior; Social dominance; Nesting; Maternal behavior

172 NAL Call. No.: QD415.A1J6

Pheromonal transmission of an aversive experience in domestic pig. Vieuille-Thomas, C.; Signoret, J.P. New York, N.Y. : Plenum Publishing Corporation; 1992 Sep. *Journal of chemical ecology* v. 18 (9): p. 1551-1557; 1992 Sep. Includes references.

Language: English

Descriptors: Pigs; Alarm pheromones; Stress; Urine; Animal behavior; Conditioning; Learning

Abstract: The process of spontaneous learning in an automatic food dispenser by a group of domestic female pigs was studied when one of the animals of the group had an aversive experience. Restraining a gilt in the dispenser without access to food resulted in later avoidance of the system by other gilts, especially when the reactions of the restrained animal had been especially violent and associated with urination. The hypothesis of a delayed transmission of an unpleasant experience was tested. The food dispenser was sprayed with urine collected from either a control gilt or from an animal undergoing stress. In half of the cases, the presence of urine of a stressed animal resulted in a long-lasting avoidance of the food dispenser, suggesting the existence of some kind of alarm pheromone produced in the urine of a sow during an unpleasant experience.

173 NAL Call. No.: 410 B77

Physiological and reproductive correlates of behavioural strategies in female domestic pigs.

Mendl, M.; Zanella, A.J.; Broom, D.M.

London : Academic Press; 1992 Dec.

*Animal behaviour* v. 44 (pt.6): p. 1107-1121; 1992 Dec. Includes references.

Language: English

Descriptors: Sows; Social dominance

Abstract: Thirty-seven pregnant primiparous domestic pigs, *Sus scrofa*, were introduced into a large indoor pen. The pigs were divided into three groups according to their ability to displace others in agonistic interactions and the behavioural characteristics of these groups were investigated. High Success pigs were able to displace at least as many individuals as displaced them. They were characterized by low levels of inactivity, high involvement in social interactions and high aggression. No Success pigs never displaced any other pig and were most inactive, least aggressive and showed low involvement in social interactions. Low Success pigs were able to displace some pigs but were more often displaced themselves. They were aggressive, despite their relative lack of success, and experienced the highest levels of aggression from and displacement by others. During the first month in the group, High Success pigs gained the most weight. Low Success pigs had the highest basal levels of salivary cortisol and showed the highest peak cortisol levels in response to an adrenocorticotrophic hormone challenge test. At the first parturition, Low Success pigs produced the lowest weight of piglets born alive. Hence there were more adverse effects associated with being aggressive and often displaced than with being aggressive and usually winning, or being unaggressive and involved in few interactions. The strategy used to cope with the social environment may be as important as the success achieved in agonistic interactions, at least in terms of consequences for physiology and

reproduction.

174 NAL Call. No.: 49 J82

Porcine somatotropin and dietary lysine influence bone mineralization and mechanical properties of bones in finishing swine.

Goodband, R.D.; Hines, R.H.; Nelssen, J.L.; Kropf, D.H.; Schricker, B.R. Champaign, Ill. : American Society of Animal Science; 1993 Mar. Journal of animal science v. 71 (3): p. 673-678; 1993 Mar. Includes references.

Language: English

Descriptors: Pigs; Somatotropin; Diet; Lysine; Bone mineralization; Blood serum; Alkaline phosphatase; Enzyme activity; Mechanical properties; Bone ash

Abstract: The femur, a rib, and a third metacarpal were collected from 108 barrows (initial weight = 57 kg) and analyzed to determine the effects of porcine somatotropin (pST) and dietary lysine on bone mineralization and mechanical properties. In Exp. 1, pigs were injected daily with 4 mg of PST and fed diets containing 1.0% Ca and .9% P and either .6, .8, 1.0, 1.2, or 1.4% lysine. Control pigs (placebo injection) received the .6% lysine diet. Bone wall thickness (BWT) of the femur increased (linear,  $P < .05$ ) but ash content decreased (linear,  $P < .10$ ) as dietary lysine level increased. Stress and ash content of the rib also decreased (linear,  $P < .05$ ) with increasing dietary lysine level. In Exp. 2, pigs were injected with either 4 or 8 mg/d of pST and fed diets containing 1.1% Ca and 1.0% P and either .8, 1.0, 1.2, or 1.4% lysine. Control pigs received the .8% lysine diet. Increasing pST dosage increased BWT of the femur (linear,  $P < .10$ ) but decreased ash content (linear,  $P < .10$ ). In the rib, increasing PST dosage reduced stress, modulus of elasticity (linear,  $P < .10$ ), and ash content (linear,  $P < .01$ ). Increasing lysine level resulted in increased BWT of the femur and decreased ash content of rib, femur, and metacarpal (linear,  $P < .10$ ). These data indicate that PST administration in conjunction with increasing lysine levels decreases bone ash content but increases BWT of finishing pigs.

175 NAL Call. No.: 275.29 M58B

Porcine stress syndrome.

Judge, M.D.; Eikelenboom, G.; Marple, D.N.

East Lansing, Mich. : The Service; 1992 Nov.

Extension bulletin E - Cooperative Extension Service, Michigan State University v.): 3 p.; 1992 Nov. In subseries: Pork Industry Handbook. Pork and Pork Quality.

Language: English

Descriptors: Porcine stress syndrome; Swine diseases; Stress; Genetic factors; Tests; Meat quality; Disease prevention

176 NAL Call. No.: SF601.T7

Porcine trypanosomosis in Nigeria: infections in local and exotic pigs in the Nsukka area of Anambra State. Onah, D.N.

Edinburgh : Scottish Academic Press; 1991 Aug.

Tropical animal health and production v. 23 (3): p. 141-146; 1991 Aug. Includes references.

Language: English

Descriptors: Nigeria; Pigs; Trypanosoma brucei; Trypanosoma congolense; Trypanosomiasis; Free range husbandry; Intensive livestock farming; Seasonal fluctuations; Breed differences; Exotics; Susceptibility

177 NAL Call. No.: S1.M57

Portable housing for poultry and hogs.

Klober, K.

Columbia, Mo. : Missouri Farm Publishing Inc; 1993 Jun.

Small Farm Today v. 10 (3): p. 38-42; 1993 Jun.

Language: English

Descriptors: Poultry housing; Pig housing; Free range husbandry

178 NAL Call. No.: SF5.B74

Postnatal care in pigs.

Hughes, P.E.

Midlothian, Scotland : The Society; 1992.

BSAP occasional publication : an occasional publication of the British Society of Animal Production (15): p. 149-161; 1992. Literature review. Includes references.

Language: English

Descriptors: Piglets; Mortality; Literature reviews

179 NAL Call. No.: 447.8 AM3

Postprandial hemodynamics and oxygenation in developing piglet intestine. Crissinger, K.D.; Burney, D.L.

Bethesda, Md. : American Physiological Society; 1991 Jun. American journal of physiology v. 260 (6,pt.1): p. G951-G957; 1991 Jun. Includes references.

Language: English

Descriptors: Piglets; Newborn animals; Feeding; Intestines; Intestinal mucosa; Oxygen consumption; Blood flow; Ischemia; Hemodynamics; Age

Abstract: Age-related differences in the intestinal hemodynamic and oxygenation responses to feeding were studied in 1-day- (never-nursed and nursed-fasted), 3-day-, 2-wk-, and 1-mo-old piglets. A distal branch of the superior mesenteric vein draining an isolated loop of jejunioileum was used to measure intestinal blood flow, arteriovenous oxygen content difference, venous pressure, and capillary pressure. Calculations of oxygen uptake and vascular resistance were performed from the measured variables. Radioactive microspheres were used to measure fractionated flow. After luminal instillation of a cow milk-based formula, postprandial oxygen uptake increased to a similar extent in all age groups. In never-nursed newborns the increase was achieved by a dramatic rise in oxygen extraction with no change in total flow, while all other groups demonstrated a combined increase in blood flow and oxygen extraction. Mucosal blood flow increased to a similar extent in all age groups, but in never-nursed newborns it was at the expense of muscularis-serosa flow. Thus, because oxygen extraction and mucosal blood flow appear to be near maximal during feeding alone, newborn intestine may be at risk for tissue hypoxia and subsequent mucosal injury in the presence of a superimposed cardiovascular stress.

180 NAL Call. No.: HV4701.A35

Potbellied pigs: Perfect pets or simply swine?.

Prince, M.

Englewood, Colo. : American Humane Association, Animal Protection Division; 1992.

Advocate v. 10 (2): p. 10-14; 1992.

Language: English

Descriptors: Miniature pigs; Pet care

181 NAL Call. No.: QL750.A6

Preference by sows for a partially enclosed farrowing crate. Phillips, P.A.; Fraser, D.; Thompson, B.K.  
Amsterdam : Elsevier Science Publishers, B.V.; 1991 Oct. Applied animal behaviour science v. 32 (1): p.  
35-43; 1991 Oct. Includes references.

Language: English

Descriptors: Sows; Farrowing pens; Age differences; Acceptability; Design

182 NAL Call. No.: QL750.A6

The preparturient behaviour of sows in enriched pens and the effect of pre-formed nests.  
Arey, D.S.; Petchey, A.M.; Fowler, V.R.  
Amsterdam : Elsevier Science Publishers, B.V.; 1991 Jul.  
Applied animal behaviour science v. 31 (1/2): p. 61-68; 1991 Jul. Includes references.

Language: English

Descriptors: Sows; Reproductive behavior; Prepartum period; Farrowing pens; Nests; Nesting; Sand; Straw

183 NAL Call. No.: QL750.A6

The process of weaning in pigs: when the sow decides.  
Boe, K.  
Amsterdam : Elsevier Science Publishers, B.V.; 1991 Apr. Applied animal behaviour science v. 30 (1/2): p.  
47-59; 1991 Apr. Includes references.

Language: English

Descriptors: Piglets; Weaning; Litter size; Sows; Suckling; Age differences; Animal behavior; Feed intake; Liveweight gain

184 NAL Call. No.: QL750.A6

Productivity, time budgets and social aspects of eating in pigs penned in groups of five or individually.  
Gonyou, H.W.; Chapple, R.P.; Frank, G.R.  
Amsterdam : Elsevier Science Publishers, B.V.; 1992 Sep.  
Applied animal behaviour science v. 34 (4): p. 291-301; 1992 Sep. Includes references.

Language: English

Descriptors: Pigs; Group behavior; Pens; Feeding behavior; Aggressive behavior; Liveweight gain; Feed intake; Feed conversion efficiency; Sex differences; Time; Pig housing; Productivity

185 NAL Call. No.: 99.9 F7662J

Prototyping an automated lumber processing system.  
Klinkhachorn, P.; Kothari, R.; Huber, H.A.; McMillin, C.W.; Mukherjee, K.; Barnekov, V.  
Madison, Wis. : Forest Products Society; 1993 Feb.  
Forest products journal v. 43 (2): p. 11-18; 1993 Feb. Includes references.

Language: English

Descriptors: Hardwoods; Lumber; Processing; Automation; Cutting; Lasers; Computer techniques; Optimization

Abstract: The Automated Lumber Processing System (ALPS) is a multi-disciplinary continuing effort directed toward increasing the yield obtained from hardwood lumber boards during their process of remanufacture into secondary products (furniture, etc.). ALPS proposes a nondestructive vision system to scan a board for its dimension and the location and expanse of surface defects on it. This information is then used to determine an efficient placement of the desired wood parts. Finally, a laser path planning algorithm is used to obtain an efficient path for the Computer Numeric Controlled (CNC) laser to follow to effectively punch out desired parts. While some individual subsystems of ALPS have been reported separately in previous communications, our recent success with the vision system required by ALPS has made the integration of the individual modules of ALPS possible. The vision subsystem and some other subsystems have been prototyped at West Virginia University. Recent efforts have been directed toward integrating these subsystems with the material-handling and laser cut-up system at Michigan State University in an attempt to create a fully functional prototype of ALPS.

186 NAL Call. No.: 49 J82

Recombinant porcine somatotropin for sows during late gestation and throughout lactation.

Cromwell, G.L.; Stahly, T.S.; Edgerton, L.A.; Monegue, H.J.; Burnell, T.W.; Schenck, B.C.; Schrickler, B.R. Champaign, Ill. : American Society of Animal Science; 1992 May.

Journal of animal science v. 70 (5): p. 1404-1416; 1992 May. Includes references.

Language: English

Descriptors: Pigs; Sows; Somatotropin; Sow lactation; Sow pregnancy; Milk yield; Feed intake; Dietary fat; Blood serum; Blood sugar

Abstract: Two experiments were conducted to evaluate whether administration of recombinant porcine somatotropin (pST) to sows (Hampshire-Yorkshire) enhanced lactational performance. In Exp. 1, sows ( $n = 84$ ) were fed a corn-soybean meal diet (17.8% CP), or a similar diet with 8% added fat, from d 108 of gestation to d 28 of lactation. Half of the sows fed each diet were injected with 6 mg/d of pST from d 108 of gestation to d 24 of lactation. Diets were fed at 2.27 kg/d from d 108 of gestation until farrowing and then were self-fed during lactation. By d 3 of lactation, litter size was standardized at 8 to 10 pigs per litter. Treating sows with pST resulted in a 10-fold increase ( $P < .001$ ) in serum somatotropin at 4 h postinjection. Serum glucose was increased ( $P < .01$ ) and serum triglycerides, creatinine, and urea N were decreased ( $P < .01$ ) by pST. During the summer, apparent heat stress occurred in pST-treated sows, resulting in 14 deaths. Most (10) of the deaths occurred just before, during, or shortly after farrowing. Fewer ( $P < .08$ ) deaths occurred when pST-treated sows were fed the diet with added fat. Sows treated with pST consumed less feed ( $P < .10$ ) and lost more backfat ( $P < .10$ ) during lactation than controls. Increasing the dietary fat did not prevent these changes. Weaning weights of pigs and milk yield of sows (estimated by deuterium oxide dilution) were not affected by pST treatment. In Exp. 2, sows ( $n = 42$ ) were injected weekly with 0 or 70 mg of pST on d 3, 10, 17, and 24 of lactation. Litters were standardized by d 3 at 8 to 10 pigs, and sows were fed the same control (low fat) diet as in Exp. 1. Sows treated with pST consumed less feed and lost more weight and backfat during lactation than untreated sows. Litter size, average pig weaning weights, and milk yield were not influenced by pST treatment. These data indicate that a 6-mg daily injection of pST from 6 d prepartum to d 24 of lactation or a 70-mg weekly injection of pST from 3 d postpartum to d 24 of

187 NAL Call. No.: 49 J82

Regional brain neurotransmitter concentrations in stress-susceptible pigs. Adeola, O.; Ball, R.O.; House, J.D.; O'Brien, P.J.

Champaign, Ill. : American Society of Animal Science; 1993 Apr. Journal of animal science v. 71 (4): p. 968-974; 1993 Apr. Includes references.

Language: English

Descriptors: Pigs; Stress; Halothane susceptibility; Porcine stress syndrome; Catecholamines; Hippocampus; Blood serum; Creatine kinase; Hypothalamus; Brain; Neurotransmitters; Genotypes

Abstract: In three experiments, the concentrations of indoleamines and catecholamines were measured in the brain regions of pigs that were homozygous-positive (nn, stress-susceptible), heterozygous (Nn), and homozygous-negative (NN, stress-tolerant) for the halothane gene. In Exp. 1 (n = 10), hypothalamic 5-hydroxytryptophan ( $P < .1$ ) and serotonin ( $P < .05$ ) were lower in nn than in NN pigs. Concentrations of 5-hydroxytryptophan, serotonin, dihydroxyphenylethylamine (DOPAMINE), norepinephrine, and epinephrine in the hypothalamus and caudate nucleus were lower ( $P < .05$ ) in nn (n = 8) than in NN (n = 7) pigs in Exp. 2. However, there were no differences in dihydroxyphenylacetic acid (DOPAC) and homovanillic acid (HVA) between nn and NN pigs. Hippocampal serotonin and norepinephrine were lower ( $P < .05$ ) in nn than in NN pigs. In the third experiment, serotonin was the only neurotransmitter that was lower in the hippocampus of Nn (n = 5) than of NN (n = 6) pigs; concentrations of all other neurotransmitters in the three brain regions were similar between Nn and NN pigs. Results from these experiments suggest central nervous system involvement in porcine stress syndrome.

188 NAL Call. No.: QL750.A6

Relationship between behaviour and adrenocortical response pattern in domestic pigs.

Borell, E. von; Ladewig, J.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 Aug.

Applied animal behaviour science v. 34 (3): p. 195-206; 1992 Aug. Includes references.

Language: English

Descriptors: Pigs; Stress; Locomotion; Vocalization; Animal behavior; Adrenal cortex; Corticotropin; Age differences; Pens; Litters; Hydrocortisone

189 NAL Call. No.: QL750.A6

The response of lactating sows to tactile visual and auditory stimuli associated with a model piglet.

Hutson, G.D.; Wilkinson, J.L.; Luxford, B.G.

Amsterdam : Elsevier Science Publishers, B.V.; 1991 Nov.

Applied animal behaviour science v. 32 (2/3): p. 129-137; 1991 Nov. Includes references.

Language: English

Descriptors: Sows; Piglets; Stimuli; Visual stimuli; Touch; Sounds; Maternal behavior; Genetic variation

190 NAL Call. No.: RA771.A1J68

Results of an educational intervention to improve the health knowledge, attitudes and self-reported behaviors of swine confinement workers. Gjerde, C.; Ferguson, K.; Mutel, C.; Donham, K.; Merchant, J. Kansas City, Mo. : National Rural Health Association; 1991. The Journal of rural health v. 7 (3): p. 278-286; 1991. Includes references.

Language: English

Descriptors: Safety at work; Educational programs; Health; Knowledge; Attitudes; Behavior; Respiratory diseases; Health promotion; Risk

Abstract: Swine confinement workers participated in an educational intervention designed to improve knowledge, attitudes, and behaviors related to respiratory disease. The desired changes were (1) improvement in knowledge about recommended gas and dust levels in buildings and benefits of using properly fitted masks; (2) improvement of attitudes about wearing dust masks, taking safety precautions, and inspecting the ventilation and heating systems; and (3) improvement in behaviors such as regular inspection of buildings and wearing an appropriate dust mask or respirator. The health risks of failing to practice these behaviors include chronic bronchitis, occupational asthma, organic dust toxic syndrome, chronic sinusitis, and even death from acute toxicity related to hydrogen sulfide. An intervention group and a nonintervention group of swine confinement workers were assessed at the beginning of the project and one year later to determine changes brought about by an educational intervention. During that year, swine producers in the intervention group were mailed a series of six educational home study modules and reference materials on confinement topics. Analysis of covariance and categorical repeated measures analysis were used to determine changes over time in the percentage of people who answered correctly in each group. Significant changes in knowledge scores, attitude scores, and reported behavior scores all favored the intervention group. The 14 statistically significant changes in knowledge items were related to dust mask use, manure pit safety, liquid manure agitation, building gas and dust norms, and recommended gas levels. The four attitudinal items that improved significantly concerned the importance of regular cleaning and upkeep, improving health and safety, knowing ways to keep buildings safer, and recognizing the benefits of wearing a dust mask. The four items about self-reported behavior changes included inspecting and servicing of building heaters, measuring

191 NAL Call. No.: 41.8 AM3

Risk factors associated with transmissible gastroenteritis in swine. Siegel, J.P.; Hungerford, L.L.; Hall, W.F. Schaumburg, Ill. : The Association; 1991 Dec01.

Journal of the American Veterinary Medical Association v. 199 (11): p. 1579-1583; 1991 Dec01. Includes references.

Language: English

Descriptors: Illinois; Pigs; Transmissible gastroenteritis virus; Risk; Animal husbandry; Databases

192 NAL Call. No.: 41.8 AU72

Rotavirus excretion by village pigs in Papua New Guinea. Alpers, D.; Sanders, R.C.; Hampson, D.J.

Brunswick, Victoria : Australian Veterinary Association; 1991 Feb. Australian veterinary journal v. 68 (2): p. 65-67; 1991 Feb. Includes references.

Language: English

Descriptors: Papua new guinea; Pigs; Rotavirus; Feces; Diarrhea; Disease transmission; Extensive husbandry

193 NAL Call. No.: SF601.C66

Salmonellosis in swine.

Schwartz, K.J.

Trenton, N.J. : Veterinary Learning Systems Company; 1991 Jan.

The Compendium on continuing education for the practicing veterinarian v. 13 (1): p. 139-147. ill; 1991 Jan. Literature review. Includes references.

Language: English

Descriptors: Pigs; Salmonellosis; Salmonella choleraesuis; Pigmeat; Serotypes; Septicemia; Enterocolitis; Differential diagnosis; Stress factors; Physiopathology; Disease control; Antibacterial agents

194 NAL Call. No.: 410 B77

The seeking of novelty and its relation to play.

Wood-Gush, D.G.M.; Vestergaard, K.

London : Academic Press; 1991 Oct.

Animal behaviour v. 42 (pt.4): p. 599-606; 1991 Oct. Includes references.

Language: English

Descriptors: Piglets; Play; Exploration; Toys

Abstract: Inquisitive exploration, in which an animal acts so as to initiate a change in its environment rather than responding to a stimulus, was studied in six litters of domestic piglets, *Sus scrofa*, aged 5-6 weeks. During 16 tests each of 5 min the piglets were allowed to enter two side pens adjacent to their home pen and with either a novel or a familiar object hidden in it. No object had any biological value to the piglets, and in each test a different novel object was used. They were placed in the same side pen over all sessions with each litter, and all litters showed a significant preference for the pen with the novel object in it first. Exploration directed towards the novel objects lasted 2.3--92 times longer than towards the familiar objects. However, the interest in the novel objects declined rapidly and significantly over the 5 min of each session. During the same time, play, i.e. scampering and sparring, increased significantly. The function of this could be to direct the attention of litter-mates towards the novel stimulus and to make them participate in the exploration. The ability of the piglets to learn to enter first the pen with the novel object and consequently to examine it is considered clear evidence for the presence of inquisitive exploration. Therefore pigs seem to possess a high level of curiosity, and the results underline the need to do away with monotonous environments if the welfare of piglets is to be considered seriously.

195 NAL Call. No.: QL750.A6

Selection of mating partners in boars and sows under multi-sire mating. Tanida, H.; Miyazaki, N.; Tanaka, T.; Yoshimoto, T.

Amsterdam : Elsevier Science Publishers, B.V.; 1991 Oct. Applied animal behaviour science v. 32 (1): p. 13-21; 1991 Oct. Includes references.

Language: English

Descriptors: Boars; Sows; Mating preferences; Sexual behavior

196 NAL Call. No.: QH540.F85

Serotype abundance distributions in reports of Salmonella incidents in domestic livestock as indicators of the population biology of Salmonella infections.

Izsak, J.; Hunter, P.R.

Oxford, U.K. : British Ecological Society; 1992.

Functional ecology v. 6 (2): p. 154-159; 1992. Includes references.

Language: English

Descriptors: Cattle; Pigs; Sheep; Fowls; Salmonella; Salmonellosis; Serotypes; Population ecology;

Epizootiology; Species diversity; Animal husbandry; Animal production; Mathematical models

197 NAL Call. No.: 49 J82

Shipping stress and social status effects on pig performance, plasma cortisol, natural killer cell activity, and leukocyte numbers.

McGlone, J.J.; Salak, J.L.; Lumpkin, E.A.; Nicholson, R.I.; Gibson, M.; Norman, R.L.

Champaign, Ill. : American Society of Animal Science; 1993 Apr. *Journal of animal science* v. 71 (4): p. 888-896; 1993 Apr. Includes references.

Language: English

Descriptors: Pigs; Transport of animals; Blood plasma; Hydrocortisone; Natural killer cells; Stress; Blood picture; Body weight; Feed intake; Social dominance

Abstract: Crossbred pigs were used to evaluate the effects of shipping stress on natural killer (NK) cell activity, leukocyte numbers, plasma cortisol, and BW changes. In the first study, pigs were bled at a commercial farm and, after shipping, resident and shipped pigs were bled again. Plasma cortisol concentrations were not different ( $P > .10$ ) because of large variation in cortisol concentrations. Furthermore, NK cytotoxicity was nondetectable among all pigs. A second study showed that plasma cortisol concentration rose by approximately 2.6 ng/mL ( $P = .018$ ) for each minute after pigs were aroused. In the third, more controlled study, pigs were housed in pens of three pigs each. Video recordings were made during the first 24 h pigs were grouped to identify socially dominant, intermediate, and submissive pigs. At time zero (before shipping), resident pigs and those to be shipped had similar plasma cortisol concentrations. However, after the 4-h shipping experience, shipped pigs had elevated ( $P < .05$ ) plasma cortisol compared with resident control pigs. Shipped pigs lost 5.1% of their BW ( $P < .05$ ) compared with resident pigs, which gained .02% of their BW. Body weight change during shipping and plasma cortisol were negatively correlated ( $r = -.34$ ,  $P = .04$ ), indicating pigs that had greater adrenal response to shipping also lost more weight during shipping. Shipping reduced ( $P < .05$ ) NK cytotoxicity among pigs of intermediate and submissive social status compared with shipped, dominant pigs. At the end of shipping or control treatments, the correlation between NK cytotoxicity and plasma cortisol was positive ( $r = .35$ ,  $P = .036$ ), indicating that pigs with greater cortisol response had greater NK cytotoxicity. In both shipping studies, numbers of blood neutrophils increased ( $P < .01$ ), lymphocytes decreased ( $P < .01$ ), and neutrophil: lymphocyte ratio increased ( $P < .01$ ) after shipping. These data suggest that 1) social status and shipping stress interact in NK cytotoxicity respo

198 NAL Call. No.: 290.9 AM32T

Simulated thermal performance of a solar-heated floor. Kocher, M.F.; DeShazer, J.A.; Bodman, G.R.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1993 Mar. *Transactions of the ASAE* v. 36 (2): p. 559-567; 1993 Mar. Includes references.

Language: English

Descriptors: Floors; Pig housing; Solar heating; Simulation models

Abstract: A low cost, simple solar heating system consisting of an active collector with an In-Floor Heat Distribution and Storage (IFHDS) system was developed in response to the energy crisis of the 1970s. A two-dimensional finite difference model was developed and used to simulate the performance of IFHDS system cross-sections. Simulation runs were conducted with a steady-periodic model for the temperature of the solar-heated air in the IFHDS system cross-section. The steady, periodic simulation results indicated IFHDS system energy efficiency increases with decreasing air temperature in the room above the IFHDS

system, peak temperature of the solar-heated air in the IFHDS system cross-section, and required temperature of the IFHDS system floor surface. The results also indicated that energy efficiency increases as thermal storage mass thickness decreases. The thermal storage mass thickness should be the minimum necessary to meet the requirements for maximum permissible daily floor surface temperature fluctuation, or time lag between time of peak, solar-heated air temperature in the IFHDS system cross-section and time of peak floor surface temperature.

199 NAL Call. No.: 290.9 AM32T

Simulation tests on the effect of floor temperature on leg abrasions in piglets.

Phillips, P.A.; Fraser, D.; Buckley, D.J.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1992 May. Transactions of the ASAE v. 35 (3): p. 999-1003. ill; 1992 May. Includes references.

Language: English

Descriptors: Piglets; Interactions; Legs; Lesions; Simulation; Trauma; Concrete; Metals; Rubber; Floors; Heat; Sliding friction; Temperature

Abstract: Piglets often develop lesions on their legs from repeated rubbing against the floor during suckling. To simulate this situation, a reciprocating, motor-driven apparatus was developed to rub leg specimens from stillborn piglets against different floor surfaces in a standardized way. Three experiments were conducted to examine the influence of floor temperature on tissue damage. Tissue damage was significantly greater ( $P < 0.001$ ) on a warmed floor (34 degrees C) than on a cooler one (21 degrees C) for all three floor types tested (concrete, rubber, metal). In a more extreme comparison (Experiment 2), rates of tissue loss were two to three times greater on a 55 degrees C concrete floor compared to a 21 degrees C floor. In Experiment 3, tissue temperature, measured by thermocouples implanted in the skin, increased rapidly when leg specimens were rubbed repeatedly on warmed (34 degrees C) rubber or concrete flooring material, occasionally reaching 53 degrees C, a level sufficient to cause burn damage to skin. The results suggest that frictional heat build-up combines with floor abrasiveness to influence rates of tissue damage, and that the common practice of warming pen floors used by piglets may increase the severity of leg lesions on many floor types.

200 NAL Call. No.: 41.8 R3224

Some observations on cardiac failure in sows.

Drolet, R.; D'Allaire; Chagnon, M.

Ottawa : Canadian Veterinary Medical Association; 1992 May.

The Canadian veterinary journal v. 33 (5): p. 325-329; 1992 May. Includes references.

Language: English

Descriptors: Sows; Heart diseases; Mortality; Predisposition; Stress; Body weight; Heat stress

201 NAL Call. No.: 49 J82

Space requirements of barrows and gilts penned together from 54 to 113 kilograms.

Arthur, R.D.; Brumm, M.C.; Christenson, R.K.; Crenshaw, J.D.; Curtis, S.E.; Gonyou, H.C.; Hines, H.; Jesse, G.W.; Johnston, L.J.; Jones, H.W. Champaign, Ill. : American Society of Animal Science; 1993 May. Journal of animal science v. 71 (5): p. 1088-1091; 1993 May. Includes references.

Language: English

Descriptors: Pigs; Space requirements; Floor area; Performance; Pig fattening; Slatted floors

**Abstract:** Two experiments, involving six experiment stations in the North Central Region of the United States, were conducted to examine the space requirements of mixed-sex pigs (barrows and gilts) from 54 to 113 kg live weight. In both experiments, corn- or milo-soybean meal-based diets were formulated within stations to contain .6% lysine and no growth-promoting feed additive. In Exp. 1, entire pens of pigs given .56, .74, or .93 m<sup>2</sup>/pig remained on test until the week that the individual pen of pigs weighed greater than or equal to 113.6 kg. In Exp. 2, treatments were .56, .74, .93, and 1.11 m<sup>2</sup>/pig and individual pigs were removed during the week that they weighed greater than or equal to 113.6 kg. There was a linear ( $P < .005$ ) improvement in ADG in Exp. 1 for the .56, .74, and .93 m<sup>2</sup>/pig treatments (.64, .69, and .72 kg/d). This response was accompanied by a linear ( $P < .05$ ) improvement in gain:feed (.247, .258, and .261, respectively). In Exp. 2, the linear ( $P < .0005$ ) response of ADG to increasing space allocation (.71, .76, .80, and .81 kg/d for the respective treatments) and the linear ( $P < .005$ ) improvement in gain:feed (.265, .268, .274, and .281, respectively) suggested that pig performance reached a plateau. These results suggest that performance of pens of mixed-sex pigs grown to 113 kg live weight was maximized at the .93 m<sup>2</sup>/pig space allocation.

202 NAL Call. No.: 58.8 J82

Spatial variability of airborne and settled dust in a piggery. Barber, E.M.; Dawson, J.R.; Battams, V.A.; Nicol, R.A.C. London : Academic Press; 1991 Oct.

Journal of agricultural engineering research v. 50 (2): p. 107-127; 1991 Oct. Includes references.

Language: English

**Descriptors:** Pig housing; Dust; Concentration; Air pollution; Spatial variation; Measurement; Particle size; Analysis; Air temperature; Velocity; Air flow; Pens; Hygiene; Animals; Stocking density

203 NAL Call. No.: DNASF601.C66

The specific stress-free system.

Tielen, M.; Scheepens, K.

Trenton, N.J. : Veterinary Learning Systems Company, Inc; 1993 Jan. The Compendium on continuing education for the practicing veterinarian v. 15 (1): p. 125-127; 1993 Jan. Includes references.

Language: English

**Descriptors:** Pigs; Pig housing; Stress factors

204 NAL Call. No.: S671.A66

Spray cooling of early weaned piglets: a first approach. Panagakis, P.; Kyritsis, S.; Papadopoulos, G.; Tambouratzis, D. St. Joseph, Mich. : American Society of Agricultural Engineers; 1992 Jan. Applied engineering in agriculture v. 8 (1): p. 106-110; 1992 Jan. Includes references.

Language: English

**Descriptors:** Piglets; Early weaning; Cooling

**Abstract:** Two field trials were conducted during the summer of 1990 to study the effectiveness of spray cooling early weaned piglets, three to four weeks old when allotted, reared under Greek summer conditions (i.e., high temperatures and low relative humidities). Overall, the cooling system did not significantly improve piglets' weight gain, feed intake, and feed conversion. However, when mean weekly pen level air temperature exceeded 28.5 degrees C (83.3 degrees F), spray cooling did tend to improve piglets' growth performance.

205 NAL Call. No.: QL750.A6

Stereotyped behaviour, social interactions and suckling pattern of pigs housed in groups or in single crates. Arellano, P.E.; Pijoan, C.; Jacobson, L.D.; Algers, B. Amsterdam : Elsevier Science Publishers, B.V.; 1992 Nov. *Applied animal behaviour science* v. 35 (2): p. 157-166; 1992 Nov. Includes references.

Language: English

Descriptors: Sows; Pig housing; Stocking density; Abnormal behavior; Piglets; Stress; Pens; Crates

206 NAL Call. No.: QP1.P4

Stereotypic behavior, adrenocortical function, and open field behavior of individually confined gestating sows.

Von Borell, E.; Hurnik, J.F.

Elmsford, N.Y. : Pergamon Press; 1991 Apr.

*Physiology & behavior* v. 49 (4): p. 709-713; 1991 Apr. Includes references.

Language: English

Descriptors: Sows; Pregnancy; Animal behavior; Animal housing; Stress; Physical activity; Hydrocortisone

Abstract: The adrenocortical response and open field behavior of a random sample of 37 individually confined gestating sows in different parities were tested around day 85 of pregnancy. The sows were classified as stereotyped [S] and nonstereotyped [N] based on 8-h individual behavioral observations during daytime. Behavioral analysis from time-lapse video recordings included percentage of time spent standing and sitting, as well as the duration spent performing elements of stereotyped actions. Blood samples were drawn for cortisol analysis by suborbital sinus puncture before and after adrenocortical stimulation with 200 IU ACTH. Locomotor activity in an open field, isolated visually and auditorily from other sows, was also studied. Seventeen sows exhibited stereotyped behavior for 54.9 +/- 4.8% of the 8-h observation period during daytime. The total time the sows spent standing and sitting was positively correlated with age and was significantly higher for [S] sows than for [N] sows. Sows in the [S] group exhibited a higher adrenocortical response to ACTH stimulation than [N] sows. Mean locomotor scores in the open field were higher for [S] than for [N] sows but these did not correlate with the physical activity and adrenocortical function in the home crate. Our results provide no evidence that the performance of stereotypies constitutes a mechanism that helps sows to cope in an environment of low complexity.

207 NAL Call. No.: S671.A66

Stochastic assessment of evaporative misting for growing-finishing swine in Kentucky.

Bridges, T.C.; Gates, R.S.; Turner, L.W.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1992 Sep. *Applied engineering in agriculture* v. 8 (5): p. 685-693; 1992 Sep. Includes references.

Language: English

Descriptors: Kentucky; Pig housing; Evaporative coolers; Mists; Stochastic models; Simulation models; Performance; Animal production

Abstract: Pig growth was simulated for a naturally ventilated growing-finishing swine facility with and without an evaporative misting system. Forty-two years of weather data for summertime conditions in central Kentucky were used to determine the simulated environment. Use of evaporative misting was found to reduce the length of a summer growth cycle by an average of 14.1 days and feed consumption by an average of 17.7 kg (39 lb) for the 42-year period. Average daily gain and feed-to-gain ratio were also improved. The economic

benefit to the producer, in terms of feed savings, ranged from \$800 to \$2,964 (coolest year to warmest year) with an average of \$1,700/year for the period of record. The results also indicated a high probability that a misting system would return the initial investment within a single average year, based on feed savings alone.

208 NAL Call. No.: SF71.2.S76 1992

Stockmanship improving the care of the pig and other livestock. English, Peter  
Ipswich, U.K. : Farming Press,; 1992.

xii, 190 p., [12] p. of plates : ill. (some col.) ; 24 cm. Includes bibliographical references (p. 175-180) and index.

Language: English

Descriptors: Animal culture; Domestic animals; Swine; Human-animal relationships; Livestock workers

209 NAL Call. No.: SF105.T5 Bd.22

Der Stolba-Familienstall für Hausschweine ein tiergerechtes Haltungssystem für Zucht- und Mastschweine [The Stolba Family Pen system for pig production]. Wechsler, Beat  
Basel ; Boston : Birkhauser,; 1991.

95 p. : ill. ; 24 cm. (Tierhaltung ; Bd. 22). Summary in English. Includes bibliographical references (p. 84-90).

Language: German

210 NAL Call. No.: HD2006.A1R3 nr.57

Struktur og produktionssystemer i dansk svineproduktion = Structural development and economic analysis of production systems in Danish pig production.. Structural development and economic analysis of production systems in Danish pig production

Sorensen, J. Bent

Kobenhavn : Statens Jordbrugsokonomiske Institut,; 1991.

78 p. : ill. ; 24 cm. (Rapport / Statens Jordbrugsokonomiske Institut, nr. 57). Summary in English. Includes bibliographical references (p. 60-62).

Language: Danish

211 NAL Call. No.: QL750.A6

A study of aggression when group housed sows are mixed. Mount, N.C.; Seabrook, M.F.

Amsterdam : Elsevier Science Publishers, B.V.; 1993 May. Applied animal behaviour science v. 36 (4): p. 377-383; 1993 May. Includes references.

Language: English

Descriptors: Sows; Aggressive behavior; Mixing

212 NAL Call. No.: QL750.A6

Suckling behaviour of sows in farrowing crates and straw-bedded pens. Cronin, G.M.; Smith, J.A.

Amsterdam : Elsevier Science Publishers, B.V.; 1992 May. Applied animal behaviour science v. 33 (2/3): p. 175-189; 1992 May. Includes references.

Language: English

Descriptors: Sows; Piglets; Suckling; Farrowing pens; Crates; Straw; Litter; Sucking; Vocalization; Maternal

behavior; Posture; Liveweight gain

213 NAL Call. No.: SF395.P62

Supplemental heat for swine.

Harp, S.L.; Huhnke, R.L.

West Lafayette, Ind. : Cooperative Extension Service, Purdue University, [1978?-1990]; 1992.

Pork industry handbook. 5 p.; 1992. In the subseries: Housing. (PIH-57), revised June 1992.

Language: English

Descriptors: North central states of U.S.A.; Pigs; Pig housing; Heating systems; Heat exchangers; Heat regulation; Heat lamps; Heating costs; Solar collectors

214 NAL Call. No.: S605.5.A43

Sustainable swine production in the U.S. corn belt.

Honeyman, M.S.

Greenbelt, Md. : Institute for Alternative Agriculture; 1991. American journal of alternative agriculture v. 6 (2): p. 63-70; 1991. Includes references.

Language: English

Descriptors: Iowa; Pigs; Animal production; Sustainability; Alternative farming; Animal husbandry; Pig feeding; Feeds; Pig manure; Waste utilization; Cycling; Nutrients; Animal housing; Animal health; Animal welfare; Animal behavior; Genetic variation; Profitability; Environmental impact

Abstract: Swine production is a major component of Corn Belt agriculture: thus development of a sustainable Corn Belt agriculture depends on sustainable swine production systems. Swine are versatile enough to adapt to sustainable concepts, and swine production raises several opportunities to enhance sustainability. These include: 1) feeding with increased use of forages and by-product feeds; 2) nutrient cycling through improved handling of manure; 3) low-capital housing systems that offer an improved environment for the operator and reduced financial risk; 4) management systems suited to the swine's behavior; and 5) preventive approaches to swine health and a broader genetic base. The challenge beyond identifying the opportunities is research and technology transfer and incorporation of sustainable concepts into ecologically based swine production systems.

215 NAL Call. No.: SF395.S92

Swine care practices.

Farley, James L.

California : California Pork Industry Group : University of California, Cooperative Extension, 1991?; 1991. 18 p. ; 28 cm. (Animal care series). Includes bibliographical references (p. 16).

Language: English

Descriptors: Swine

216 NAL Call. No.: SF396.3.S96 1992

Swine facilities & equipment.

Clemson University, Cooperative Extension Service

Clemson, S.C. : Cooperative Extension Service, Clemson University,; 1992; C5935Ex 3.A36-3 no.557.

41 p. : ill. ; 22 x 28 cm. (AEnL (Clemson University. Cooperative Extension Service) ; 557.). Cover title. July

1992.

Language: English

Descriptors: Agricultural engineering; Swine

217 NAL Call. No.: SF396.3.S92 1992

Swine farrowing handbook housing and equipment., 1st ed.. Friday, William H.

Midwest Plan Service

Ames, IA : Midwest Plan Service, Agricultural and Biosystems Engineering Dept., Iowa State University,; 1992.

iv, 52 p. : ill. ; 28 cm. MWPS-40. Includes index.

Language: English

Descriptors: Swine farrowing facilities

218 NAL Call. No.: SF395.P62

Swine growing-finishing units.

Meyer, V.M.; Driggers, L.B.; Ernest, K.; Ernest, D.

West Lafayette, Ind. : Cooperative Extension Service, Purdue University, [1978?-1990]; 1991 Jun.

Pork industry handbook. 7 p.; 1991 Jun. Housing, (PIH-11), revised, June 1991.

Language: English

Descriptors: Pigs; Pig housing; Pig fattening

219 NAL Call. No.: 41.8 C81

Swine models for cardiovascular research: a low stress transport and restraint system for large swine.

Lighty, G.W. Jr; Spear, R.S.; Karatay, M.C.; Hare, C.L.; Carlson, R.J. Ithaca, N.Y. : Cornell Veterinarian, Inc; 1992 Apr.

Cornell veterinarian v. 82 (2): p. 131-140; 1992 Apr. Includes references.

Language: English

Descriptors: Pigs; Disease models; Cages; Restraint of animals; Transport of animals; Stress; Safety; Blood specimen collection; Echocardiography

220 NAL Call. No.: S1.M57

Swine on pasture: a viable production option for the small producer. Klober, K.

Columbia, Mo. : Missouri Farm Publishing Inc; 1993 Feb. Small Farm Today v. 10 (1): p. 16-19; 1993 Feb.

Language: English

Descriptors: Pigs; Animal husbandry; Pastures; Grazing; Small farms

221 NAL Call. No.: 290.9 AM32T

Swine responses to constant and modified diurnal cyclic temperatures. Xin, H.; De Shazer, J.A.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1991 Nov. Transactions of the ASAE v. 34 (6): p. 2533-2540; 1991 Nov. Includes references.

Language: English

Descriptors: Pigs; Responses; Air temperature; Behavior; Feed intake; Growth; Heat loss; Simulation; Unrestricted feeding; Water intake

Abstract: Ad libitum fed and individually penned crossbred gilts (39 +/- 2 kg) were exposed to a constant air temperature of 30.8 degrees C (CON) and equal-mean diurnal cyclic temperatures cycling from 26 degrees to 33 degrees C (RPK) and from 23.4 degrees to 40 degrees C (RNT). Fluorescent lighting with an intensity of 800 to 1100 L/m/m<sup>2</sup> was provided from 0600 h to 2100 h. Measurements of feed intake, heat loss rates, water usage, growth, and ingestion behavior were made for a five-day period and replicated six times. Daily average heat loss rates, water usage, and feed conversion of the RPK and RNT pigs could be predicted with those of the CON pigs. However, daily feed intake and growth of the RNT pigs, 1.56 kg and 0.70 kg, respectively, were reduced ( $p < 0.01$ ) compared to the CON pigs (1.71 and 0.82) and the RPK pigs (1.78 and 0.84). Ingestion patterns of the pigs for all treatments were characterized by a meal size of 160 to 170 g/meal-pig, drink size of 250 to 270 g/drink-pig, meal frequency of 9 to 11 meals/day, drink frequency of 36 drinks/day-pig, meal duration of 13 to 14 min/meal, and drink duration of 0.6 min/drink. Hourly feed intakes of the pigs were unevenly distributed throughout the 24-h period. Total heat production generally increased about two to three hours after an increase in feed intake and declined accordingly.

222 NAL Call. No.: 49 J82

Teaching standard agricultural practices that are known to be painful. McGlone, J.J.; Hicks, T.A. Champaign, Ill. : American Society of Animal Science; 1993 Apr. *Journal of animal science* v. 71 (4): p. 1071-1074; 1993 Apr. Includes references.

Language: English

Descriptors: Animal welfare; Teaching; Pain; Stress; Castration

Abstract: Animal science faculty teach, demonstrate, and ask students to perform procedures that are known to be painful. Potentially painful procedures include castration, branding, dehorning, ear notching, teeth clipping, beak trimming, comb and wattle removal, and tail docking. In each case, the degree of pain experienced by an animal is generally not known. Furthermore, the consequences of animals having to endure pain are also not fully understood. A survey was conducted of animal science faculty to identify current departmental policies and practices related to castration in beef and swine production classes. Departments vary in what they require of students. Departments should set a policy to address 1) which (and how) potentially painful procedures are taught and 2) how the faculty deal with students who refuse to participate in putatively painful procedures. The institutional animal care and use committee should approve potentially painful teaching procedures after instructor and department have concluded that teaching such procedures is essential to a complete educational experience.

223 NAL Call. No.: 410.9 P94

A technique for serial sampling of cerebrospinal fluid from conscious swine and sheep. Prelusky, D.B.; Hartin, K.E.

Cordova, Tenn. : American Association for Laboratory Animal Science; 1991 Oct. *Laboratory animal science* v. 41 (5): p. 481-485; 1991 Oct. Includes references.

Language: English

Descriptors: Pigs; Sheep; Cerebrospinal fluid; Sequential sampling; Catheters

**Abstract:** We devised a method for the atraumatic repeated collection of cerebrospinal fluid samples from conscious swine and sheep. Indwelling needles, with injection caps, were secured intracisternally and protected with plastic "crowns" attached to their skulls. The crowns permitted the animals freer movement with minimal risk of damage to the needles. With sheep, cerebrospinal fluid was withdrawn directly by puncturing the selfsealing injection caps attached to the hubs of the fixed needles. With the pigs, which are less amenable to handling, lengths of sterile polyethylene tubing inserted into the fixed needles enable collection without continuously disturbing the pigs. Serial samples were withdrawn from sheep (.10 to .30 ml) for up to 3 weeks with no problems, and from pigs (.05 to .15 ml) for 8 to 12 days, until the cannulae failed.

224 NAL Call. No.: 49 J82

Techniques for evaluation and quantification of pig reproductive, ingestive, and social behaviors.

McGlone, J.J.

Champaign, Ill. : American Society of Animal Science; 1991 Oct.

Journal of animal science v. 69 (10): p. 4146-4154; 1991 Oct. Literature review. Includes references.

Language: English

Descriptors: Pigs; Animal behavior; Animal experiments; Methodology; Measurement; Physiology

**Abstract:** A literature survey was conducted to find papers that reported pig behavior during the period 1987 to June 1990. A total of 171 papers reporting measures of pig behavior was identified. Investigators used either descriptions of behavior or they quantified behavior. Behavior was quantified by recording frequency, durations, sequences, or bouts of behavior. Sexual behavior was often recorded as an all-or-none event (e.g., they were bred or not). Feeding behavior was studied by either weighing feeders often or by operant techniques. Operant feeding devices were commonly used to study pig feeding and drinking behaviors. Social behavior was studied either as interactions among established groups or when pigs fought after grouping. In either case, behavioral frequencies or durations were often reported. A large number of papers documented studies of maternal-neonatal interactions, teat orders, and animal care issues. Only a few studies reported mechanisms controlling pig behavior. Because few studies investigated behavior-genetics or physiological mechanisms controlling pig behavior, these areas of investigation hold great opportunity for future improvements in pork production.

225 NAL Call. No.: 290.9 AM32T

Three-dimensional buoyant turbulent flows in a scaled model, slot-ventilated, livestock confinement facility.

Hoff, S.J.; Janni, K.A.; Jacobson, L.D.

St. Joseph, Mich. : American Society of Agricultural Engineers; 1992 Mar. Transactions of the ASAE v. 35

(2): p. 671-686. ill; 1992 Mar. Includes references.

Language: English

Descriptors: Pig housing; Air flow; Simulation models; Temperature; Ventilation

**Abstract:** A three-dimensional turbulence model was used to determine the effects of animal-generated buoyant forces on the airflow patterns and temperature and airspeed distributions in a ceiling-slot, ventilated, swine grower facility. The model incorporated the Lam-Bremhorst turbulence model for low-Reynolds Number airflow typical of slot-ventilated, livestock facilities. The predicted results from the model were compared with experimental results from a scaled-enclosure. The predicted and measured results indicated a rather strong cross-stream recirculation zone in the chamber that resulted in substantial three-dimensional temperature distributions for moderate to highly buoyancy-affected flows. Airflow patterns were adequately

predicted for  $Ar(c) > 40$  and  $J$  values  $< 0.00053$ . For  $Ar(c) < 40$  and  $J$  values  $> 0.00053$ , the visualized patterns indicated that the jet separated from the ceiling before the opposing end-wall. This discrepancy was attributed to variations in the experimental and numerical inlet flow development assumptions.

226 NAL Call. No.: 41.8 V641

Time in lairage needed by pigs to recover from the stress of transport. Warriss, P.D.; Brown, S.N.; Edwards, J.E.; Anil, M.H.; Fordham, D.P. London : The Association; 1992 Aug29.

The Veterinary record : journal of the British Veterinary Association v. 131 (9): p. 194-196; 1992 Aug29. Includes references.

Language: English

Descriptors: Pigs; Transport of animals; Stress; Recovery; Time; Blood; Lactic acid; Creatine kinase; Hydrocortisone; Endorphins

227 NAL Call. No.: 41.8 R3224

Total plasma creatine kinase activity in relation to Phi and Pgd phenotypes in normal and stress-susceptible Landrace pigs.

Doize, F.; Martineau-Doize, B.; DeRoth, L.

Ottawa : Canadian Veterinary Medical Association; 1992 Apr.

The Canadian veterinary journal v. 33 (4): p. 263-264; 1992 Apr. Includes references.

Language: English

Descriptors: Pigs; Creatine kinase; Enzyme activity; Blood plasma; Phenotypes; Stress; Susceptibility; Halothane; Genes

228 NAL Call. No.: 41.8 V641

Treatment and care of pet pigs.

Duran, O.; Walton, J.

London : The Association; 1992 Dec19.

The Veterinary record : journal of the British Veterinary Association v. 131 (25/26): p. 572-573; 1992 Dec19.

Language: English

Descriptors: Miniature pigs; Pet care

229 NAL Call. No.: SF395.P62

Troubleshooting swine reproductive failure.

Evans, L.; Britt, J.; Kirkbride, C.; Levis, D.

West Lafayette, Ind. : Cooperative Extension Service, Purdue University, [1978?-1990]; 1992.

Pork industry handbook. 5 p.; 1992. In the subseries: Reproduction. (PIH-96), revised December 1992.

Language: English

Descriptors: U.S.A.; Pigs; Reproductive performance; Reproductive behavior; Reproductive physiology; Reproductive traits; Reproductive organs; Abortion; Reproductive disorders; Mummification; Stillbirths

230 NAL Call. No.: 49 J82

Two reduced nocturnal temperature regimens for early-weaned pigs. Brumm, M.C.; Shelton, D.P. Champaign, Ill. : American Society of Animal Science; 1991 Apr. *Journal of animal science* v. 69 (4): p. 1379-1388; 1991 Apr. Includes references.

Language: English

Descriptors: Piglets; Night temperature; Pig housing; Pens; Air temperature; Environmental temperature; Feed intake; Liveweight gain; Feed conversion; Energy consumption; Heating costs; Growth

Abstract: Two experiments, each consisting of three trials and using 3- to 4-wk-old newly weaned pigs, were conducted to evaluate the effects of two reduced nocturnal temperature regimens on weaned pig and subsequent growing-finishing performance and nursery energy (propane and electricity) use. In Exp. 1, nursery treatments were 1) a control temperature (CT) regimen of 30 degrees C constant air temperature lowered 2 degrees C/wk and 2) a regimen for pigs in pens with hovers (MRNT-H) in which the temperature from 1900 to 0700 beginning 1 wk after weaning was lowered 6 degrees C from the 0700 to 1900 temperature setting, which was 3 degrees C lower than CT. The nursery temperature treatments in Exp. 2 were 1) CT and 2) a 10 degrees C reduction in air temperature (MRNT10) from 1900 to 0700 from CT beginning 1 wk after weaning. In addition, within each temperature, diet sequences of 1.2% lysine for 3 wk followed by 1.0% lysine vs 1.15% lysine offered continuously were evaluated. In Exp. 1, there was no effect ( $P > .1$ ) of temperature on feed intake but ADG decreased ( $P < .001$ ) in two of the three trials for MRNT-H vs CT and feed/gain worsened ( $P < .05$ ) in all trials. In Exp. 2, there was no difference between MRNT10 and CT for ADG and feed/gain. No interaction was observed between nursery diet and temperature regimen for weaned pig performance. There was no effect ( $P > .1$ ) in either experiment of nursery temperature on subsequent growing-finishing performance. Overall energy savings comparing the MRNT-H and CT treatments were 68 MJ per weaned pig. Energy savings for Exp. 2 were 79 MJ per weaned pig. Application of cyclical temperatures in a controlled manner can result in energy savings of approximately \$.50 per pig weaned under the conditions of these experiments.

231 NAL Call. No.: SF83.G3S3 Heft 63

Untersuchungen zu Einzel- und Gruppenhaltung tragender Sauen unter besonderer Berücksichtigung von Leistung, Konstitution und Verhalten [Studies on individual and group rearing of pregnant sows with special regard to performance, constitution and behavior].

Taureg, Susanne,

Kiel : Selbstverlag des Institutes für Tierzucht und Tierhaltung der Christian-Albrechts-Universität; 1991. 132 p. : ill. ; 21 cm. (Schriftenreihe des Institutes für Tierzucht und Tierhaltung der Christian-Albrechts-Universität zu Kiel, Heft 63). English summary. Vita. Includes bibliographical references (p. 121-130).

Language: German

232 NAL Call. No.: SF83.G3S3 Heft 70

Untersuchungen zur integrierten Gruppenhaltung von Sauen unter besonderer Berücksichtigung von Verhalten, Konstitution und Leistung [Studies on integrated group housing of sows with special regard to behavior, constitution and performance].

Gertken, Georg

Kiel : Institut für Tierzucht und Tierhaltung der Christian-Albrechts-Universität zu Kiel; 1992.

143, [1] p. : ill. ; 21 cm. (Schriftenreihe des Institutes für Tierzucht und Tierhaltung der Christian-Albrechts-Universität zu Kiel, Heft 70). Summary in English. Includes bibliographical references (p. 122-139).

Language: German

233 NAL Call. No.: 41.8 Am3

Use of a DNA-based test for the mutation associated with porcine stress syndrome (malignant hyperthermia) in 10,000 breeding swine. O'Brien, P.J.; Shen, H.; Cory, C.R.; Zhang, X.

Schaumburg, Ill. : The Association; 1993 Sep15.

Journal of the American Veterinary Medical Association v. 203 (6): p. 842-851; 1993 Sep15. Includes references.

Language: English

Descriptors: U.S.A.; Cabt; Canada; Cabt; England; Cabt; Pigs; Porcine stress syndrome; Susceptibility; Pig breeds; Laboratory tests; Dna; Mutations; Gene frequency; Breed differences

234 NAL Call. No.: 41.8 C163

Use of body surface area to set minimum space allowances for confined pigs and cattle.

Hurnik, J.F.; Lewis, N.J.

Ottawa : Agricultural Institute of Canada; 1991 Jun.

Canadian journal of animal science v. 71 (2): p. 577-580; 1991 Jun. Includes references.

Language: English

Descriptors: Pigs; Cattle; Space requirements; Body surface area; Animal welfare

235 NAL Call. No.: HD1761.A1M5 no.91-26

Using nature as both mentor and model animal welfare research and development in sustainable swine production.

Halverson, Marlene K.

St. Paul, Minn. : University of Minnesota, Institute of Agriculture, Forestry and Home Economics,; 1991. 44 p. ; 28 cm. (Staff paper P ; 91-26). June 1991. Includes bibliographical references (p. 34-40).

Language: English

236 NAL Call. No.: DISS F1992051

Vergleich der gegebenen Bedingungen der Schweinemast in Sudoldenburg mit den Bestimmungen der "Verordnung zum Schutz von Schweinen bei Stallhaltung" vom 30. Mai 1988 unter Berücksichtigung klinischer Symptome bei den Masttieren [Comparison of given conditions for fattening pigs in South Oldenburg and regulations of the 'order for the protection of pigs held in pens' from 30. May 1988 with particular regard of clinical symptoms in fattening animals]. Wubbelmann, Heinrich

Hannover : [s.n.]; 1992.

122 p. : ill. ; 21 cm. Summary in English. Includes bibliographical references (p. 107-122).

Language: German

237 NAL Call. No.: SF601.I4

Vice, mutilations and welfare of pigs.

Oldham, J.

London : British Veterinary Association; 1992 Nov.

In practice v. 14 (6): p. 305-306, 308; 1992 Nov.

Language: English

Descriptors: Uk; Pigs; Animal welfare; Tail biting; Vices; Pig housing; Docking; Teeth; Castration

238 NAL Call. No.: HV4761.A5

Wanted: a humane manufacturer to produce the Edinburgh football. Harrison, R.  
Washington, D.C. : The Institute; 1993.

The Animal Welfare Institute quarterly v. 42 (1): p. 17; 1993.

Language: English

Descriptors: Pigs; Toys; Animal welfare

239 NAL Call. No.: 275.29 W27P

Washington Meat Animal Quality Assurance Program.

Smith, J.; Busboom, J.

Pullman, Wash. : The Service; 1992 Jun.

Extension bulletin - Washington State University, Cooperative Extension Service (1676): 21 p.; 1992 Jun.

Includes references.

Language: English

Descriptors: Cattle feeding; Cattle husbandry; Pig feeding; Feed additives; Veterinary products; Meat quality;  
Meat inspection

240 NAL Call. No.: BJ52.5.J68

We should not manipulate the genome of domestic hogs.

Sapontzis, S.F.

Guelph, Ontario, Canada : University of Guelph; 1991.

Journal of agricultural & environmental ethics v. 4 (2): p. 177-185; 1991. Includes references.

Language: English

Descriptors: Pigs; Genetic engineering; Animal welfare; Ethics

241 NAL Call. No.: 280.8 J822

Welfare effects of the national pseudorabies eradication program. Ebel, E.D.; Hornbaker, R.H.; Nelson, C.H.  
Ames, Iowa : American Agricultural Economics Association; 1992 Aug. American journal of agricultural  
economics v. 74 (3): p. 638-645; 1992 Aug. Includes references.

Language: English

Descriptors: U.S.A.; Aujeszky virus; Pigs; Livestock numbers; Disease control; Consumer surplus; Market  
prices; Demand; Production costs; Returns; Supply elasticities; Mathematical models; Programs; Welfare  
economics

Abstract: A welfare methodology is adapted to evaluate market and distributional effects of a completed  
pseudorabies eradication effort in the U.S. The model predicts small market effects from pseudorabies  
eradication. Welfare analysis suggests that, in states generating relatively large hog numbers, producers will  
experience a net gain from eradication in all scenarios considered, yet in smaller hog producing areas  
individual hog operations may lose producer surplus. Consumer surplus changes vary by scenario but are

always positive. In general, the national pseudorabies eradication program is to be economically efficient.

242 NAL Call. No.: QL750.A6

The welfare of pigs in two farrowing/lactation environments: cortisol responses of sows.

Cronin, G.M.; Barnett, J.L.; Hodge, F.M.; Smith, J.A.; McCallum, T.H. Amsterdam : Elsevier Science Publishers, B.V.; 1991 Nov. Applied animal behaviour science v. 32 (2/3): p. 117-127; 1991 Nov. Includes references.

Language: English

Descriptors: Sows; Animal welfare; Farrowing; Pens; Sow lactation; Hydrocortisone; Blood plasma; Stress; Corticotropin; Piglets; Mortality; Liveweight gain

243 NAL Call. No.: 275.29 N272EX

When do sows eat?.

Weldon, W.C.; Lewis, A.J.

Lincoln, Neb. : The Service; 1991.

EC - Cooperative Extension Service, University of Nebraska (91-219): p. 13-15; 1991. In the series analytic: 1991 Nebraska Swine report / compiled by W.T. Ahlschwede.

Language: English

Descriptors: Sow feeding; Feed intake; Sow pregnancy; Sow lactation; Restricted feeding; Unrestricted feeding; Feeding behavior

244 NAL Call. No.: S13.A53 nr.108

Wplyw systemu wentylacji na okres ogrzewczy w warchlakarni = The effect of ventilation system on heating season length in a building for early-weaned pigs.. Effect of ventilation system on heating season length in a building for early-weaned pigs

Kuczynski, Tadeusz

Wroclaw : Wydawn. Akademii Rolniczej we Wroclawiu,; 1992.

49 p. : ill. ; 24 cm. (Zeszyty naukowe Akademii Rolniczej we Wroclawiu. Rozprawa habilitacyjna, nr. 108).

In Polish; summary in English. Includes bibliographical references (p. 43-48).

Language: Polish

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