Current Events

MEETING REPORTS

Alternatives to Intensive Husbandry

A symposium entitled "Alternatives to Intensive Husbandry Systems" was held July 13-15, 1981 in Kent, England by the Universities Federation for Animal Welfare. Speakers presented a number of valuable papers that explored alternative systems of animal husbandry and provided cost/benefit comparisons of such alternatives to current confinement systems of livestock production.

Margaret Perry (Harper Adams Agricultural College, Shropshire) presented detailed observations of the behavior of free-range sows during farrowing. She reported that aggressive, hierarchical fighting is greatly reduced if the sows are introduced well before their first service as gilts, so that all contests to establish hierarchy may be settled before conception. Aggression related to social dominance, which appears at feeding time, may also be minimized by widely distributing the feed or providing the animals with separate feeding areas, or, alternatively, with feeding cubicles or pens. Near the time of farrowing, all sows showed nest building behavior to varying degrees, such behavior having not been altered or eliminated despite many generations of domestication. The sows were also observed to eat the placenta. Interestingly, under these free-range conditions and in the absence of any protective rails, the death rate of piglets, from having been laid upon by the sow, rarely exceeded 10% during the first week. Perry emphasized the importance of selecting for free-range farrowing sows with a strong mothering instinct, such as is seen in the saddleback cross. Perry made the important point that under free-range conditions, parturition is rapid, while for sows in farrowing crates, parturition is usually prolonged. Prolonged parturition results in a higher incidence of intra-partum stillbirths due to anoxia. Other problems associated with confinement farrowing units were also discussed. The heated creep areas often used to keep the piglets warm may be an unnecessary expense, as the sow's udder is able to provide all the needed warmth. The sow's ability to create a suitable micro-climate by building a nest would also seem to preclude the need for supplemental heat. Another problem cited was the inability of confined sows to get away from their litters, resulting in oversuckling, which can lead to intestinal problems in the piglets.

H.S. Hawkins (Baxter Parker Ltd., King's Lynn) presented a paper on the outdoor breeding, rearing and finishing of swine. The statistics compiled by Hawkin's company clearly reveal the economic viability of free-range swine production. The company has some 2,000 breeding sows and produces 38,000 pigs per year. It also maintains an intensive unit of 350 sows and thus had reliable economic figures for comparison. Feed consumption was only slightly higher on the extensive unit: 1.37 tons sow feed/year compared to 1.28 tons/year on the intensive unit. Consumption for weaned pigs was identical for both systems at 36 kg feed/25 kg weaner sold at 8-10 weeks of age. Intensive units have higher labor costs as more time is spent cleaning out, washing down, etc. The labor cost per year for the intensive unit was £48,123 compared to £39,789 for the extensive system. Veterinary costs were greater under the intensive system: £25.38 per sow per year compared to £22.20 per sow per year under the extensive system. The difference in veterinary costs can be attributed to the lower incidence of respiratory disease under extensive conditions. Energy expenditures totaled almost £7,000 per year for the intensive unit, while the cost of providing gas for creep heating in the extensive unit was £2,500. Tractor and van costs, including fuel, were £3,805 higher on the extensive

unit. With sundry costs such as rent and water figured in, overall operating costs are about £6,000 per year higher for the intensive unit. Productivity for both units compared very closely: With both systems producing 20 pigs/sow per year, the cost per weaner produced on the extensive unit was 63 pence lower than on the intensive unit. Hawkins concluded by stating that the selection of a suitable soil type to ensure good drainage (ideally, sand or gravel on a chalk substrate), good stockmanship and careful keeping of performance records are the necessary elements in a profitable extensive pig-breeding operation.

A. Stolba (Edinburgh School of Agriculture) presented an interesting paper entitled "A family system in enriched pens as a novel method of pig housing," in which various husbandry systems were compared with the housing of pigs in an enriched, complex environment. The theoretical basis for these studies is the recognition of the need for qualitative improvement in the environment, with the provision of key stimuli specific to the behavioral requirements of the species. Four families of sows and their offspring were housed in a system which provided for nesting and rooting and included a corridor connecting the neighboring pens. Various structures such as partitioning walls, headfeeding stalls, farrowing rails and rubbing posts were present. The main substrate was straw, while peat was provided in the rooting area. Details of behavioral differences between sows kept under conventional and these more enriched conditions were described. One interesting conclusion drawn was that the less enriched the environment, such as when housing is increasingly stripped of structures, the more behavior is redirected away from the physical environment and toward other pigs (see Sambraus, *Int J Stud Anim Prob* 2(5):245-248, 1981). A significant overreaction toward novel objects was also demonstrated in hogs kept under the more impoverished conditions. It was also found that stereotypies in stalled sows increased with the number of litters farrowed. Among sows housed together in more enriched environmental conditions, very distinct social bonds developed, with a significant reduction in aggressive behavior, even to the point of sharing of nests between sows having litters. Under the family system described above, piglet mortalities during the fattening period were greatly reduced in comparison to conventional systems. Virtually all losses occurred at an earlier stage in the life of the piglets. Weaning occurred naturally between the 10th and 15th week. During the summer and winter months, the faster-growing pigs reached market weight for bacon at 145 days. A second group was slaughtered at 156 days, and the slow growers at 170 days. A boar was introduced while the sows were still lactating, with pregnancy resulting before weaning of the preceding litter. In the family pens, where sows and litters are housed together from birth to slaughter and pigs are never shifted or mixed, the fattening time was shortened by 20 days. Although this family system is only in the experimental stage, the production figures obtained to date are promising, according to Stolba. The system's primary assets are good fattening performance and the encouraging prospect of mating during lactation, which renders early weaning, with all its implications for welfare, obsolete. Since mating occurs during lactation, with the boar being introduced to the group 20 days after farrowing, more litters can be produced (2.3 litters per year in this case). There are also prospects of shortening the cycle even more. Under this system, sows must be fed on a high level of nutrition before mating. For growing pigs, food intake and conversion seem to be similar to conventional systems. This study clearly shows how basic ethological research on domestic animals can contribute significantly to the applied design of housing conditions appropriate to a species' behavior.

Professor D.W. Sainsbury (University of Cambridge) presented a paper based on his study of the covered strawyard system for the production of eggs from

laying hens. The covered strawyard is a simple covered shed, uninsulated and naturally ventilated, but which nonetheless provides good protection from the weather. It is an open-fronted monopitch house, approximately 20 ft deep with the open side facing south. The floor is deeply strawed, about 1 ft deep, and provides about 3 sq ft for each bird. The house contains laying boxes of 5 birds/box, hanging feeders and drinkers, and moveable perch units for roosting. Artificial lighting is provided to boost winter egg production. Significantly, Sainsbury reported that production is virtually the same for the cage and strawyard systems, but food consumption has been lower in the strawyard system. Operating costs are minimal, as there are no fans or other mechanical equipment. The straw is an expense, but as Sainsbury pointed out, it helps make a valuable manure. Eggs can be kept clean if the litter is properly maintained. A disadvantage of the strawyard system is that it requires more skill and care to operate than the cage system. Sainsbury concluded that while the system is not likely to be one favored by large operators, it does fit ideally into the mixed farm system.

Arnold Elson (Agricultural Development and Advisory Service, Shardlow Derbyshire) discussed various modifications of existing battery cage systems designed to improve the overall welfare of laying hens. Elson reviewed the work of Tauson in Sweden, who has made several modifications of commercial battery cage systems to reduce trapping, abrasion, and injury to the hens. Significant improvements have been made and incorporated into operations. Elson also gave an update of research on the "get-away" cage system. The get-away cage provides useable vertical, as well as horizontal, space for birds by the inclusion of perches, feeding and drinking units at multiple positions, nest boxes, and dust baths. The provision of perches in cages has significantly improved foot conditions in heavy birds. However, research on the get-away cage has been suspended because of several problems. Notably, eggs were laid on the cage floor outside the nest boxes. Eggs were dirty, birds were contaminated with manure from those perching above, and feed intake was higher than in the conventional cage system. Research on the cage design is continuing in other European countries, where further modifications have been implemented. One such modification is a sloping floor, which enables the eggs to roll outside of the nest boxes to a collecting area, thus avoiding contamination by fecal material. Separate dust baths have also been provided in an attempt to dissociate dust-bathing and nesting and thus reduce the contamination of nest boxes and eggs. Some success has resulted from these modifications although several problems still remain. Elson concluded that while the get-away cage does widen the bird's behavioral repertoire, it is not yet certain that it is practically and commercially viable.

Amanda Hill (Ministry of Agriculture, Fisheries and Food, Gleadthorpe) provided an in-depth discussion of aviary systems for laying hens. The aviary system is similar to a conventional litter or wire floor system, differing only in the addition of extra floors of wire or slats. The feeders, drinkers, and nest boxes are provided on each of the floors and the various levels are connected by ladders. The provision of extra flooring allows the stocking density within the house to be increased beyond that obtained under a conventional litter system. This reduces the capital cost per bird housed and provides a warmer house temperature. The additional ventilation afforded by the extra body heat of more birds improves the environmental quality by reducing condensation, lowering ammonia levels, and improving litter conditions. Hill described a number of problems encountered, among them differences in adaptibility between strains and the necessity of relocating nest boxes in order to encourage birds to use the boxes for laying. Regardless of nest type, the single tier of nests along

each side wall was found to be more popular than any single tier of central nests. The reasons for this remain obscure. Further research is needed to elucidate why some birds are reluctant to use nest boxes. The need for higher feed intake requires exploration although this could be attributed to excessive waste of food in the aviary, which could be reduced by redesigning the type of feeding system. Ammonia levels still tend to be unacceptably high; it is hoped that further research will remedy this problem. Hill emphasized that these studies are preliminary and intended to investigate only the practicalities of the aviary system. No attempt has been made to assess whether the system improves the welfare of the hens and is economically viable.

Paul Carnell (Earth Resources Research Ltd, London) discussed the feasibility of conducting an economic appraisal of less intensive systems in egg production and the breeding of swine. A major problem is the dearth of information on costs and performance of poultry and swine under nonconfinement conditions. Further research is needed on developing alternative systems before an in-depth and meaningful economic appraisal can be made. In spite of these limitations, Carnell presented a valuable comparative analysis, especially of alternatives to the battery cage system. He pointed out that a Gallup Poll conducted in England in September 1980 showed that 60% of the consumers would be willing to pay more for nonbattery eggs. According to Carnell, his own studies demonstrate that the commercial advantages of intensive systems may not be as marked as is often assumed. This is particularly true with swine practices, as reflected in the coexistence of a wide range of husbandry methods still being used in swine production. In egg production, Carnell concludes that the advantages of battery cages are minimal in relation to intensive indoor flock systems and it is likely that a significant commercial niche exists even for more extensive production systems. Carnell also pointed out that despite the results of the Gallup poll, consumers generally do not want higher prices. (However, price is only one criterion affecting choice. Quality and acceptability of the production system are further considerations. As veal producers have learned in the U.K. from the widespread public rejection of veal raised in confinement, the consumers must be well-informed to be able to choose effectively. It is difficult, however, to make informed choices at the marketplace when there is inadequate and sometimes misleading labeling. This is particularly true of "free-range" eggs, which may not, in fact, be the product of hens raised under optimal free-range conditions.) Carnell emphasized that swine and poultry production have become increasingly competitive, with the profit margin per animal narrowing considerably. Consequently, small changes in costs or performance with only marginal implications for consumer prices have a more substantial impact upon producers' profits. Carnell made the important point that the labor requirement for less intensive systems is greater, and skilled stockmen are difficult to find. Thus, farmers who wish to minimize dependence upon nonfamily labor are likely to find more attractive those systems that substitute capital for labor. Related to this is the fact that less intensive systems present a greater challenge to good stockmanship and management. There are fewer environmental controls, mechanical aids and constraints upon the behavior of livestock. More demands are made upon the skill and judgment of the farmer, and thus the economic penalties for poor management may prove more serious under nonintensive systems. — *M.W. Fox*

(*Note:* Not all papers presented at the meeting are covered in this report.)

First European Symposium on Poultry Welfare

A Symposium on Poultry Welfare convened by the Danish Branch of the

World's Poultry Science Association was held in Koge, Denmark June 9-12, 1981.

The meeting was attended by close to 100 delegates, mostly from Europe but including several from the United States and Canada. The program was divided into four Topics: (1) The Measurement and Interpretation of Behavior Observations; (2) Effects of Technical Features on Welfare; (3) Choice of Production Systems for Egg-layers; (4) Anatomical Modifications and Induced Moulting.

Each Topic occupied a one hour session during which 3 or 4 technical papers were presented on various aspects of the Topic under discussion.

The Conference then split up into a number of discussion groups, each group numbering just under 20 and each having its own Chairman and Reporter. The groups met separately and discussed the papers for 1½ hours, producing conclusions and recommendations in many cases while highlighting areas of controversy in others. Requests for further information and clarification of certain points from the authors of the Topic papers were frequently called for and a number of questions were formulated.

At the end of each Group session, the full Conference reconvened for a plenary session. The reporter for each group then read out the conclusions and recommendations of his group and finally put to the panel of speakers the agreed-upon questions. What time was left was available to the body of the Conference to put further queries to the Speakers' Panel.

The organizers are to be congratulated on planning a format which I believe enabled delegates to extract the maximum benefit from the meeting, and for having the final text of all papers available at the beginning of the program.

As to the papers themselves, nearly all were of a high standard. The first session contained contributions from Dr. Ian Duncan on "Telemetry" and by Dr. G.C. Brantas on the "Interpretation of Behavioral Observations," which were of particular interest to veterinary ethologists. Duncan showed that birds which showed excessive "flightiness" may in fact be the less stressed as their "alarm reaction," accompanied as it was by increased heart rate and a temperature drop in the feet, subsided much more rapidly than the so-called "placid" strains. In other words, breeders who set out to select birds best suited to an intensive and (possibly) more stressful environment may have been using entirely the wrong parameters to guide them. The similarity of the time course of the physiological and behavioral measures supported the concept of fear as an intervening variable which has simultaneous effects on heart rate and behavior, and both may be effective in assessing the extent of fear. Dr. Brantas began by telling his audience that he was forced to accept the analogy-postulate without which we were unable to interpret behavioral observations from the viewpoint of welfare. He then went on to select 37 behavioral parameters that had, in his opinion, a relation to welfare and scored these from 1 to 3, the lower scores showing better welfare and the highest score the worst. Battery cages showed, predictably perhaps, the worst welfare score and the deep litter system the best, with the behavioral cage ("Getaway") lying between the two. Dr. Brantas pre-empted criticism by admitting to defects in his choice of parameters and acknowledging that his scoring was a trifle arbitrary.

The papers in the second session contained an important contribution from Dr. Ragnar Tauson on improving cage design. Alterations to cage sides and fronts had resulted in better foot health, better skin health and fewer trapped birds. The use of plastic floors and abrasive strips (to limit excessive claw growth) were also discussed. Other papers in this session were by Dr. Bavassano on "Cage Floor Design" and Dr. Emmans on "Temperature for Egg Layers." I found it difficult to accept the contention of this last speaker that feather loss in caged birds was "entirely due to inadequate feeding," as he

claimed in the discussion period.

The Topic for the third session covered the Aviary system by Dr. Amanda Hill, Deep Litter and Sloped Wire Floor systems by Dr. Petersen and the "Getaway" cage system by Professor Wegner. The cost per bird housed at the new Aviary Unit at Gleadthorpe described by Dr. Hill raised some "ahh's" from the audience, being about double the cost of traditional battery houses and incidentally also about double the German version of the aviary house at Prof. Wegner's Institute at Celle, which, unlike the Gleadthorpe unit, also incorporates an automatic egg collection system.

The last session covered "Induced Moulting" by Dr. Jensen, "Welfare Aspects Related to Number of Laying Periods" by Prof. Simonsen, "The Anatomy of the Beak" by Dr. Gentle, and "The Effects of Beak Trimming" by Dr. Eskeland. Dr. Gentle demonstrated that there were important taste buds and numerous sensory receptors with an extensive nerve supply on the buccal surface of both upper and lower beak. The bird's beak serves not only to grasp and manipulate food particles prior to ingestion but is also used as a tool in nesting behavior, exploration, drinking, preening and as a weapon in aggressive encounters. To deprive the bird of part of its beak as in "de-beaking" or "beak trimming" is not only found to be painful but will radically alter the bird's behavior and the quantity and quality of sensory input that the bird may enjoy with an intact beak. Dr. Gentle believed that there was a good chance too that beak trimming may lead to the formation of neuromas. Dr. Eskeland sought to show that beak trimming increased egg production and improved food conversion ratio. This assertion was not accepted by some of us who believed that what he had demonstrated was not a better food conversion ratio but a smaller food wastage. If such is true there is surely need to redesign the trough or the structure of the feed rather than to redesign the bird.

Apart from the scientific sessions there was an enjoyable hiatus on the second day devoted in the morning to a visit to the Tybjerg Central Poultry Farm to witness beak trimming and Marek's vaccination and to a tour of Tybjerg's hatchery and rearing units. After this came a visit to the Tyvelse family farm where 6000 hens were kept in a Pennsylvania wire floor house. These birds had been 86 weeks in lay—and showed it! Then on to a Forest Inn for something as far removed from an English pub-lunch as I can imagine—gargantuan might be the word to describe it.

Although the Conference was billed as a Poultry Welfare Conference, one sensed that the underlying reasons for us all being there were economic and political. A few years ago Denmark exported 60% of her egg production. Now she produces only enough for her own needs. The Danish producers blame unfair competition insofar as they have hitherto been prevented by law from using the most profitable methods for producing eggs, *i.e.*, the battery cage. They wish to get on equal terms with their Continental competitors applying the same rules and conditions, which must be agreed upon and promulgated by Brussels. The Commission, under pressure from Germany and no doubt supported by other EEC governments, wishes to "legitimize" the German animal welfare law of 1972 and can only do this by supplanting national legislation by EEC directive. It remains to be seen what happens when the EEC representatives who were present at the Conference report back to their masters.

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FORTHCOMING MEETINGS

American Association for the Advancement of Science: Annual Meeting, January 3-8, 1982, Washington, DC. Contact