CONCLUSION TO THE SYMPOSIUM

The First North American Symposium on poultry welfare attracted a large and diverse group of participants, including individuals from government, academia, industry, and the animal welfare community. In the workshops following the paper sessions, participants were asked to consider the following three questions: What welfare problems exist? What solutions are there to these problems? What further research is needed to address these problems? The conversations were lively and thought-provoking, and generated many innovative ideas. Perhaps inevitably, however, they also turned frequently to discussion of the particular economic and social circumstances that have been so influential in the way in which this issue has progressed (or failed to progress!) in North America. Although there was a consensus that immediate improvements in poultry welfare were possible, there were also a host of factors that made implementing these improvements challenging. What follows is a synopsis of the major points that came from the workshops and discussions after the presentations.

THERE ARE PRACTICAL METHODS ALREADY AVAILABLE TO IMPROVE POULTRY WELFARE

Practical methods for improving poultry welfare are already available, particularly in the area of catching/depopulation, handling, and slaughter. Training of handlers should be emphasized, both in the house and at the slaughter facility. In the case of broilers, financial incentives can be given to encourage careful bird handling. The provision of additional space in houses for handling and improved cage design to facilitate removing hens from cages would improve hen welfare during depopulation. Mechanization of broiler and laying hen handling also appears to be desirable, but further development of mechanized procedures is necessary to increase the potential for commercial use. Transportation and slaughter could be improved by providing increased protection for birds during transport to prevent crates from falling from the truck and to better control the thermal environment; by incorporating temperature and humidity sensors in trucks; and by adopting standards for line speeds, stunning currents and voltages, and maintenance of stunning equipment to ensure that all birds are properly stunned prior to exsanguination.

As far as management is concerned, immediate welfare improvements could be made in broiler management by decreasing stocking density and adopting lighting and feeding programs to slow growth and decrease skeletal problems. Adequate inspection of flocks and timely culling of injured, sick, or incapacitated birds are also important. Improvements could be made in laying hen welfare by decreasing population density in cages and by adopting improved cage designs (e.g., cages with horizontal bars and abrasive strips to decrease claw length). Closer attention to ensure uniformity of feed formulation and improve feed quality is important for the welfare of both broilers and layers.

TECHNOLOGY TRANSFER IS CRITICAL

If the improvements above are to be implemented, technology transfer between researchers and producers must be greatly improved. In particular, European research results have not been widely disseminated in North America. A first step is heightened awareness in the industry about animal welfare concerns and problems. The production advantages associated with improved poultry welfare need to be emphasized to the industry. Good management can minimize welfare problems, so knowledge about improved methods must be communicated to managers and their staff. Efforts should also be made to get welfare-friendly systems of the types developed in Europe into production (or at least into testing).
least into the research and development stage) in North America.

**THEORY VERSUS PRACTICE**

Technology transfer will only be successful, however, if production realities are considered. The first set of realities concerns the applicability of university-based research. Research done on small flocks or using strains of birds different from those used currently by the industry makes application of the research results in the commercial setting difficult. Welfare researchers thus need to consider applicability when designing their studies. Straightforward, simple, cost-effective modifications are most likely to be accepted by producers. Producer involvement and investment in studies is important in facilitating adoption of research findings.

The second (although related) set of realities concerns economics. As one of the workgroups framed the issue, the main problem is to increase welfare while preserving dollars. Welfare science cannot divorce itself from economic considerations. Economics tend to act against change even when there is a sufficient knowledge base. In the case of broilers, for example, economic decisions about stocking density and growth rate have negative consequences on welfare. Because economics are a major motivating factor, rapid change is most likely to occur if economic incentives or disincentives are present. For this reason, more effort must be made to identify and improve the cost:benefit ratios of proposed changes in housing or management practices. Both national and international (trade policies) economic factors need to be considered, as do consumer realities. For example, will consumers accept modified cages even if these are found to be acceptable for welfare based on scientific evidence? Effects on product quality should also be assessed.

Many participants felt that behavior-genetic research should be emphasized, particularly given the apparent difficulties involved in making cost-effective improvements to the environment. Areas in which genetic research could potentially contribute to improvements in welfare are fast growth problems (both skeletal problems and ascites), selection of strains that are better adapted to cage or alternative production systems, and selection against undesirable behaviors (e.g., feather pecking and cannibalism).

The participants were divided about the best approach to move welfare issues forward in North America. Some thought that legislation was necessary and would “level the playing field” so that economic considerations could be less prominent. Others thought that voluntary standards and codes developed by the industry were a better approach than legislation. Regardless of approach, there was agreement on the importance of communication and consensus development among the various stakeholders, including legislators, producers, scientists, extension personnel, and animal protection organizations. Finding common ground can result in progress, even if the solutions arrived at are not necessarily the most desirable or permanent solutions.

**RESEARCH NEEDED**

Despite the potential for immediate improvement, there were also many areas identified where further research is needed. These include:

- Equipment design for new facilities
- Gas stunning methods that are effective and also consider crew safety
- Alternative, less stressful methods to induce molting that still ensure a complete molt
- Identification and breeding of stocks that do not require beak-trimming
- Workable alternative production systems for laying hens
- Changing physiology and needs of broilers as a result of selection
- Mechanization of handling and loading of broilers
- Spent hens: development of a use for spent hens; improved methods of on-farm disposal to ensure a humane death
- Identification of human factors responsible for welfare problems (e.g., attitudes of handlers)
- Broken bones in hens: causes, economic effects, methods to decrease breakage, including dietary modifications at end-of-lay
- Effect of journey times and crate densities on broiler welfare during transport
- Improved house design to facilitate handling and catching
- Welfare effects of practices like toe-trimming and the use of NozBonz to prevent broiler breeder males from using the female feeders
- Perch design for layers and broilers
- Quality of house environment in relation to seasonal environmental extremes

**DEFINING WELFARE**

Even though practical solutions and research needs were emphasized, the recurring theme that welfare is difficult to define and measure was never far from the surface of the discussions. The need for science-based information was emphasized frequently. However, decisions about animal welfare are based not only on science, but also on human values and ethics (Tannenbaum, 1995). Does ensuring animal welfare require providing for animal happiness as well as eliminating suffering? (Mench, 1998) What is more important—feelings or biological functioning or both (Duncan and Fraser, 1997), and if the latter, how do we make decisions when measures conflict? Arriving at minimum space requirements for laying hens provides an example of the difficulties in separating science and sensibility. Research has shown that hens given less that about 460 cm² of space have higher corticosterone levels, decreased production, greater feather loss, higher mortality, and are more nervous (Guide for the Care and
Use of Agricultural Animals, 1998). But hens need more room than that (about 500 cm\(^2\)) just to stand normally, and considerably more room (up to 1,800 cm\(^2\)) to perform various behaviors, including comfort behaviors (Dawkins and Hardy, 1989). If placed in a large area, preferred distances from another hen are even greater, at least during certain kinds of activities, ranging up to several meters (Keeling and Duncan, 1991). The answer to the question: “What is the right space requirement for a laying hen?” is thus “on what measurement(s) of welfare do you place the most value?” It is only by continuing the process of discussion initiated at the European and North American poultry welfare symposia that we will begin to arrive at a consensus about balancing ethics and science, as well as realistic solutions to welfare problems.

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