

Whether TSCA will be challenged or not, EPA is developing its biotechnology regulation policy. Hill says he is determining what types of altered microbes must appear on the Office of Toxic Substances' (OTS) inventory of chemicals.

TSCA exempts naturally-occurring chemicals but, says Hill, no one has answered, either legally or philosophically, what is natural. "Is a microor-

ganism, mutated by ultraviolet radiation, still a natural thing?" he asks. "Is naming just the genus and species adequate for a listing? There are hundreds of *E. coli* strains," he said, "and each one can do something different." Reflecting upon the uncertainties which confront many of his colleagues at the EPA, he flatly stated: "We have so many questions and so few answers."—**Paula E. Dwyer**

**ANIMAL RESEARCH**

## EMBRYO RECOVERY RATES SLOWLY IMPROVE

FORT COLLINS, Colorado—Embryo transfer technology has not progressed significantly over the past year if the results reported at the Ninth International Embryo Transfer Society meeting are an index of this new field. Before embryo transfer can have wide commercial use, the average success rate of embryo freezing must be greatly improved, the necessary training must be made readily available, and the overall cost must be lowered. Nevertheless, some achievements were reported and useful market-oriented concepts were discussed among the nearly 600 participants. Erskine H. Cash of Pennsylvania State University mentioned that even with the limitations of current technology, embryo transfer is an alternative that must be considered by any beef producer who wants to develop and maintain a top-quality herd.

Several of the speakers revealed new developments in embryo freezing which result in greater than the normal 25–50% success rate. J. P. Renard and his colleagues from France reported a freezing and one-step thawing technique which yielded 80% as many progenies as the non-frozen control group. Using the standard 1.5 molar glycerol solution with the embryo contained within a straw,

Renard adds a 25 molar solution and separates the liquids with a tiny air bubble. Upon thawing, the air bubble is shifted to mix the two solutions.

J. F. Hasler of Em Tran, Inc. reported that pregnancy rates for implanted embryos remain at about 50%, but some factors affecting success have now been identified. Hasler's investigations indicate that fertilization rates, collection rates, and embryo numbers vary inversely with the number of superovulations in Holsteins. In addition, the number of ova which can be recovered when follicle stimulating hormone (FSH) is injected depends upon phase of estrus cycle during injection day, daily milk yields, age of cow, time since calving, and season.

Reuben J. Mapletoft of the University of Saskatchewan outlined a number of compelling arguments for commercial breeders to accelerate their investment in embryo transfer research. He mentioned that few advances have been made in embryo transfer technology over the last several years, but techniques have been refined and there have been some improvements in success rates. Further work should reveal opportunities for the selection and storage of animals with specific commercial

traits; determination of matings according to the rancher's schedule instead of the cow's; identification and development of pedigrees; increased salvage value; establishment of methods for the convenient shipping of embryos; and the development of a genetic bank to preserve special traits during epidemics and other disasters.

Another participant, Betsy Dresser of the Cincinnati Zoo and the Kings Island Wild Animal Safari, noted an additional important application of embryo transfer: preservation of endangered species by using donor mothers of abundant species. Dresser reported preliminary work being done to prepare the way for the use of elands as recipients for the embryos of rare antelopes. In this type of trans-specific work, eland embryos are now being transferred to domestic cows (Holsteins). Dresser noted that researchers are also attempting to transfer tiger embryos into lions and to implant wild cat embryos into domestic cats.

**REGULATION**

## DUTCH SOFTEN DNA GUIDELINES

THE HAGUE—The Ad Hoc Committee on Recombinant DNA Work in the Netherlands has proposed new guidelines for the use of genetically engineered microorganisms in cultures of 10 liters or more. Concluding that detailed regulations are neither necessary nor possible, the committee proposed that the potential hazards of every project be judged individually, an approach similar to that proposed by the Genetic Manipulation Advisory Group in the United Kingdom. The new rulings will not be implemented until the committee receives comment from scientists and the public.

The Dutch committee, which has softened the guidelines year by year since their inception in 1976, is generally following the trend of the National Institutes of Health's Recombinant DNA Advisory Committee (RAC) in the United States. The Dutch advisory body, chaired by P. G. de Haan, recommended the establishment of a new class of experiments, which have relaxed safety standards relatively. Experiments in this group, called Safe Microbiological Techniques (*Veilige Microbiologische Technieken*), still have to be sent to the committee, but no extensive safety evaluation will be undertaken.

The immediate benefits of this new proposal to the Dutch biotechnology industry are not apparent. Large-scale use of recombinant DNA tech-

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REASONS

Embryo recovery rates can be improved when two glycerol solutions of different molarity are mixed during the thawing process.

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