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and the Administration of Justice
for Hearings on H.R. 1556
the Transgenic Animal Patent Reform Act
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by
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STATEMENT OF WILLIAM LESSER

On H.R. 1556

Transgenic Animal Patent Reform Act

I am William Lesser, an Associate Professor of Agricultural Economics at Cornell University. My area of specialization is marketing, including the activities of farm input suppliers and the implications of the number and size of firms on prices and other aspects of performance. In the agricultural commodity area, I have specialized in livestock marketing and am now writing a text book on the subject.

For the past eight years I have been involved with interpreting the implications of patents on agriculture. That work began with an examination of the Plant Variety Protection Act and has since included patented plants and animals, with implications for international harmonization. On the subject of animals, I prepared the background paper for the Office of Technology Assessment's recent report on New Developments in Biotechnology 5: Patenting Life (Chapter 7). For December 1988 I organized and contributed to the first major international symposium on animal patents, with the edited proceedings soon to be published by Macmillan (Lesser 1989). This all I believe makes me qualified to offer some observations on the proposed Transgenic Animal Patent Reform Act (HR 1556).

From the perspective of an economist, there are three primary issues to consider when evaluating Section 2 of this Act with its provisions to exempt farmers from requiring permission to reproduce patented livestock. The most fundamental issues are its probable benefits compared to the likely costs. More practical in nature is the matter of determining who is a "farmer" eligible for the waiver of royalty payment. These points will be addressed in turn. There is no issue raised here on the desirability of Section 4, the banning of the patenting of humans.

BENEFITS OF H.R. 1556

The benefits of this legislation will be largely the avoidance of several perceived economic problems identified in the 1987 Subcommittee Hearings as hardship for small farmers and the establishment of a monopoly position by a few large biotech firms. Other identified concerns, animal welfare and genetic diversity, are more appropriately directed to the existence of transgenic research on animals and not to the issue of patent infringement.

The monopolization of animal breeding would indeed be a serious matter. It is however important to recognize that already there are very few firms worldwide producing advanced breeds of some major species. For chickens there are 20, but of these only 7 for white laying hens. Entry is very difficult because the pure lines, the basis of traditional breeding programs, are almost exclusively in private hands. For the advanced lines of pigs there are but 4 firms internationally supplying 20-25 percent of breeding pigs (references in Lesser 1989, pp. 89). In these sectors there is little more concentration possible. More importantly, this concentration occurred in the absence of patents and without apparent overcharging for the products. The apparent lack of monopoly prices is explainable by the nature of the product. Farmers value breeding stock based on expected profit, and breeders provide detailed performance data on their breeds. In such an environment farmers simply will not pay more for a new breed than it will earn them. Indeed, farmers are tough bargainers with a history of paying no more than 25 to 50 cents for each dollar of productive value of a new breed (Butler and Marion pp. 60-63).

This does not say one should be complacent about competition in animal breeding, only aware of its particular competitive characteristics. In the long term the best guard against monopoly is the public ownership of pure lines. The public also has a role in providing competition through the release of commercial varieties direct to farmers. (For a discussion of the analogous case with plant varieties see Butler and Marion). Patents with royalty collection can be an assist in that effort as universities turn

increasingly to patenting as a means of self funding of research (see Lesser 1987b).

The hardship to small farmers is a related notion as small farmers are feared not to be able to afford the transgenic varieties. From an economic perspective that argument is not supportable. Farmers typically borrow heavily for annual production costs with the loans due after the crop is sold. (These production cost loans are distinct from the long term land investment loans which have contributed to the loss of farms over the past few years). The amount of the loan is related to the expected profits of production. Higher priced animals with a higher profit potential would generally increase the amount of the loan available to farmers. Futures markets are available to bankers and farmers to reduce the price risk of these transactions. Saying that small farmers cannot afford transgenic animals is in effect saying that the banking system is badly flawed, and no evidence has been provided to support that position.

Indeed, H.R. 1556 if enacted could contribute to just the problem it is intended to avert. Section 2 effectively bars the collection of royalties so that private investors must earn any return on the first sale of the transgenic variety. This will greatly inflate the sale price. It will also turn the purchase from an annual production investment into a long term one. Risk is increased because prices can not be hedged on the futures markets over multiple years. In the long term debt market the cash poor small farmer may indeed be disadvantaged compared to larger farms with greater cash flows.

Small farmers may be disadvantaged by any bias of transgenic animal technology to large farms. Size economies in equipment are widely believed to have been a major contributor to the loss of 39 percent of small farms over 1969-1982 and the concomitant rise in large farms. Transgenic animals do not have such inherent size economies. There is no conceptual reason why a small dairy farmer with sixty cows cannot benefit as much from transgenic animals as can the mega-dairy farm with 2,000 cows (see discussion in Marion et al., 1988). However the reality is the better managers will benefit most and better managers tend to operate larger farms. Thus the indirect effect of transgenic animals will likely be an escalation in farm size. But this can occur

whether or not H.R. 1556 is passed; the issue is the technology, not the technicalities of infringement. The matter can perhaps best be addressed through management training programs such as the "Pro Dairy" Cooperative Extension program at Cornell University.

COSTS OF H.R.1556

The principal cost of this Bill is a likely reduction in private (and possibly public) research investment. The removal of the infringement stipulations in Section 2 effectively prevents the collection of royalties under a patent. Royalties are paid in exchange for permission to use a patent. This is a major reduction in the benefit of a patent which reduces the incentive to invest in transgenic animal research. It is frequently, if somewhat misleadingly, stated that patents cannot be proven to contribute to research investment. That may be technically true due to the kind of proof needed. Considering, however, plant variety protection, the analysis is easier because the U.S. law was passed in 1970 making a before and after evaluation possible. The evidence shows a significant increase in private investment (Butler and Marion; Brim) and some indication of improved varieties as a result (Perrin et al.). What is true for plant variety protection is likely more so for patents because patent protection is broader than allowed under the Plant Variety Protection Act. (For a comparison of the laws see Lesser, 1987a).

More directly, the passage of H.R. 1556 is likely to reduce the availability to small farms of what transgenic animals are produced by the private sector. The reasons for this are quite straightforward. Unable to collect royalties under a patent, the private investor will likely turn to private contracts to accomplish the same end. Private contracts are however more costly to enforce than patent agreements because it is not a violation for a third party to be using one of the animals. Rather, the inventor must prevent one of these animals from falling into the hands of a third party. One way for firms to reduce the enforcement costs is to contract only with large farms. Small farms thus can be denied access no matter how efficient they are. This approach is not to the benefit of the research firms because they would like as large a market as possible, but

it may be the only way to earn a return on the investment.

Regulations are well known to distort the market process, and this could happen in an additional way under H.R.1556. Inventors are to be prohibited from enforcing animal patent infringement (Section 2(h)(1)) but not when the patent is applied to the transformed vector which is creating the unique traits of the patented animal. Thus firms can be expected to bypass the intent of H.R. 1556 by patenting a DNA sequence rather than the animal proper. Royalties would be legally owing on animals containing that sequence.

DEFINITION OF "FARMER"

A practical matter, should this Bill become law, is the determination of who qualifies as "a person whose occupation is farming" (Sec. 2(h)(1)). Two other federal statutes allow specific exemptions for farmers. The Capper-Volstead Act grants limited antitrust exemptions to "persons engaged in the production of agricultural products as farmers ..." (7 U.S.C. Sec. 291) to form cooperatives and the Plant Variety Protection Act permits individuals "whose primary farming occupation ..." (7 U.S.C. Sec. 2544) to save and sell on a non commercial basis seed from protected varieties. Both definitions have been subject to rather unsatisfactory court review (Case-Swayne Co., Inc. v. Sunkist Growers, Inc. (389 U.S. 384 (1967)) and Asgrow Seed Co. v. Kunkle Seed Co., Inc., et al. (Appeal No. 87-1402 (Court of Appeals for the Federal Circuit))). Under H.R. 1556 there is a distinct possibility that breeders could develop with the purpose of propagating patented livestock by claiming exemption from infringement under Section 2. The resulting litigation would be complex and costly, a further distinctive to researchers and legitimate farmers not knowing the practical bounds of the exemption. At a minimum, it would be desirable to prohibit the sale by farmers of patented animals for breeding purposes. Drawing again a parallel with the "farmers exemption" in Plant Breeders' Rights legislation, this is the system outside the U.S. and the barring of sales has been proposed as an amendment to the U.S. PVPA by a broad panel of experts (Plant

Patenting Workshop).

CONCLUSIONS

- * The costs of H.R. 1556 seem to outweigh the benefits.
- * The Bill could exacerbate some of the factors it is intended to avert, notably disadvantaging small farmers.
- * The exemption for farmers will create some very difficult interpretation problems.

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