

Genome news highlights loss of chicken strains

Future research is already under threat, as budget cuts wipe out irreplaceable lines.

Sir — Publication of the chicken genome sequence and comparative analysis last week (*Nature* **432**, 695–716 and 717–722; 2004), together with a map of more than 2.8 million single nucleotide polymorphisms, is a cause for celebration. The best way to make sense of these data is to manipulate the genes of living organisms. But worldwide stocks of the animals needed to pursue such gene-function studies are dwindling, and in the United States they are being lost to budget cuts. So the future of avian research looks dim despite the opportunities — for understanding the genetic bases for development, immunity, host–pathogen interactions and disease resistance — offered by the chicken genome project.

Avian stocks are being eliminated in university, government and commercial facilities faced with budget constraints. The crisis described in 2003 by J. E. Fulton and M. E. Delany (*Science* **300**, 1667–1668; 2003) has not been addressed, and additional stocks are being eliminated or threatened. Five different US sites have eliminated stocks in the past year alone. We estimate that at least two-thirds of the developmental mutant lines and more than half the inbred

lines held in North America are located in threatened facilities. Unfortunately, given the struggle to maintain living stocks, efforts towards developing new chicken lines for research has virtually stopped. This is in striking contrast to the situation in the mouse, where the generation of new genetic strains has become a priority at almost every major biomedical institution (see “Geneticists prepare for deluge of mutant mice”, *Nature* **432**, 541; 2004).

Often the decision to eliminate poultry lines is made with insufficient time to respond. Further, many genetic strains are now held at only one facility, making these vulnerable to loss from disease outbreaks such as avian influenza and exotic Newcastle disease. Today, the only US government support for conservation exists in the National Animal Germplasm Program (NAGP) of the US Department of Agriculture’s Agricultural Research Service. This programme, with \$679,000 funds per year, has a mandate to preserve species from cattle to aquatic organisms, mostly by cryopreservation. The NAGP currently has 162,000 units of animal germplasm; fewer than 1,300 (<1%) are chicken semen samples.

No avian embryo samples or ova are cryopreserved at the NAGP. The nature of avian ova means that current cryopreservation techniques are of limited value.

Both immediate action to preserve the remaining poultry resources and long-term, sustainable solutions are essential. An internationally supported plan needs to be developed and implemented for maintaining avian genetic stocks and exploiting them for both biomedical and agricultural research. Funding is needed to develop facilities — similar to those of the Jackson Laboratory in Bar Harbor, Maine, for mouse strains — to conserve important chicken genetic stocks, to develop means of ova cryopreservation, and to make stocks available for research. Replacing lost stocks, especially of rare inbred strains, will take many years at substantially greater cost than that of preserving what we have now.

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