

# Auckland Island's Pigs and Xenotransplantation

## Level 3 Achievement Standard 91602 Biology 3.2

*Integrate biological knowledge to develop an informed response to a socio-scientific issue*

Xenotransplantation is the transplant of an organ or cells from an individual of one species into an individual of another species.

The first successful human organ transplant was achieved in 1954. This was a kidney transplant between identical twins. Since then the procedures and techniques for transplants have improved significantly and today there is a large shortage of donor organs and tissues.

One solution to this shortage is using organs and tissues from a different species - xenotransplantation. Pigs have been identified as a potential species to use as donors for human transplants. Pig insulin has already been used to treat type 1 diabetes in humans due to its similarities with human insulin. Transplanting the actual cells that produce the insulin from pigs into humans could eliminate the need for diabetics to regularly inject themselves with insulin and seems a logical next step.

A problem with using tissues and organs from a different species is the potential infection by diseases from the donor species. When it was found that pigs carry a virus that has the potential to infect humans, research into the transplantation of insulin producing pig cells to humans was stopped.

Recently it has been found that there is one small population of pigs that have managed to remain free of this virus. The Auckland Island pigs that were released onto these sub-Antarctic Islands in the 1800s have been isolated from other pigs since their release and remain disease free. In 1999 a group of these pigs were captured and brought back to mainland New Zealand before an eradication programme began on the Auckland Islands.

These pigs have enormous potential to be used for xenotransplantation in humans.



Figure 1: Auckland Island pigs taken from the Islands before the eradication program began. Image from zoochat.com.



## **Social Issues relating to Xenotransplantation to be considered**

### **Economic**

Money could be spent on alternative treatments.

Money could be spent encouraging people to become organ donors. New Zealand has low rates of organ donation.

In the case of pigs often the organs and tissues being used for transplants are just thrown away and using them for transplants makes economic sense.

### **Ethical**

Is it right to breed pigs to be used for human medical treatments?

What sorts of conditions are these pigs kept in and how are they treated before we use them?

### **Cultural**

Some cultures and religions have particular thoughts and feelings towards pigs. For example some believe that pigs are unclean and shouldn't be eaten let alone used for human transplants.