What is bovine serum used for?

There is a wide range of applications for processed bovine serum. Perhaps the most important is in the field of pharmaceuticals where it is used in the research, manufacture and control of human and veterinary vaccines and of drugs ("biopharmaceuticals") derived using "biotechnology" (in other words techniques involving living organisms) many of which are at the cutting edge of drug development. Fetal bovine serum is also used extensively in research. A technique known as "cell culture" is widely applied in the manufacture of both vaccines and biopharmaceuticals and bovine serum is extensively used in cell culture. A little more background on cell culture may be of interest here.

Since the middle of the last century there have been many developments in the fields of vaccinology and biotechnology and it would be courting controversy to try to rate them in order of importance. No one, however, would argue that as far as human and animal health is concerned one of the front-runners would be the development of the techniques of cell culture.

Cell culture is the process by which cells – human, animal or even insect – are grown under controlled conditions *in vitro* (outside the body). The possibility of maintaining animal tissues outside the body – at least for short periods of time – was demonstrated more than one hundred years ago. However, it was not until the 1940s and 1950s that the techniques were refined to produce cell cultures that could be used to cultivate viruses (which will only grow in living cells). This paved the way for the first virus vaccine to be produced using cell culture – polio vaccine, in 1955. The contribution to human and animal health of the vaccines that have resulted from the application of this technology is an ongoing and global success story.

More recently cell culture has been combined with what are called recombinant techniques to develop so-called recombinant-derived products ("biopharmaceuticals"). Whereas vaccines are almost invariably used to prevent disease these biopharmaceuticals offer important new opportunities for treatment and diagnosis. They are a hugely important and very rapidly expanding area of modern medicine.

Another significant and growing application of cell culture is in the safety testing of widely used products such as cosmetics and household chemicals. As the use of live animals for the safety testing of such products (cosmetics especially) has come increasingly under the political and ethical spotlight, cell culture technology has been used more and more to reduce or eliminate testing in animals.

These are only three examples of the many available. Cell culture techniques are an essential tool, and have made, and will continue to make, a very significant contribution in many of those areas of biomedical science and research that will benefit humans and animals.