

Ethical and scientific alternatives to foetal bovine serum – why FBS should be a thing of the past

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Foetal bovine serum (FBS) is a supplement widely used in cell and tissue culture to enhance cell growth and division, despite its many scientific disadvantages being widely discussed in the scientific community (van der Valk et al, 2018).

In addition, ethical and legal considerations should play a more substantial role in the discussion on the use of FBS. This is due to the fact that FBS is derived from the blood of bovine foetuses after their removal from the slaughtered dam. Foetal blood is harvested by cardiac puncture. This is usually performed without stunning or anaesthesia of the foetus, resulting in massive ethical and animal welfare concerns, as potential pain and suffering cannot be excluded (van der Valk et al, 2004). But ethical considerations should not only include the foetuses but start as early as with the dams, as transportation of pregnant cows can cause distress and suffering and can trigger (premature) birth and even abortion, especially in the late stages of gestation.

Moreover, blood harvesting for FBS production lacks binding regulations, resulting in a legal grey area and therefore opens the door for mistreatment or even fraud to the detriment of animals, scientists and patients. However, alternatives to FBS do exist and further use and development of ethically acceptable substitutes should be promoted. In our presentation we argue that instead of justifying FBS collection as a necessary evil and continuing to use a product that is questionable for a variety of reasons, the way forward should be a substantial change that starts from the way we treat farm animals and spans the replacement of FBS by alternatives that are more humane and scientifically sound.

References:

- van der Valk, J., Mellor, D., Brands, R. et al. (2004) The humane collection of fetal bovine serum and possibilities for serum-free cell and tissue culture, *Toxicology in Vitro* 18, 1–12. doi:10.1016/j.tiv.2003.08.009;
- van der Valk, J., Bieback, K., Buta, C. et al, (2018) Fetal Bovine Serum (FBS): Past – Present – Future, *ALTEX* 35, 99-118. doi.:10.14573/altex.1705101