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Czech Journal of Animal Science

The role of nitric oxide synthase isoforms in aged porcine oocytes

Nevoral J., Krejčová T., Petr J., Melicharová P., Vyskočilová A., Dvořáková M., Weingartová I., Chmelíková E., Tůmová L., Hošková K., Kučerová-Chrpová V., Sedmíková M.:

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In the sphere of reproductive biotechnologies, the demand for sufficient numbers of high-quality oocytes is still increasing. In some cases, this obstacle is overcome by *in vitro* prolonged

cultivation. However, a prolonged oocyte culture is accompanied by changes called ageing. Ageing is manifested by spontaneous parthenogenetic activation, programmed cell death or lysis. Various substances, such as caffeine or dithiothreitol, have been tested for ageing suppression. In this respect, research into gasotransmitters (hydrogen sulphide, carbon monoxide, and nitric oxide) has currently been intensified. The objectives of the present study were to localize nitric oxide synthases (NOS) and to evaluate NOS inhibition of aged porcine oocytes. We demonstrated the presence of NOS isoforms in oocyte cultivation prolonged by 24, 48, and 72 h. After 72 h of prolonged cultivation, NOS inhibition by the non-specific inhibitor L-NAME or the specific inhibitor aminoguanidine caused suppression both of programmed cell death and lysis. Although NOS amount rapidly decreased after the 72-h cultivation, changes induced by NOS inhibition were statistically significant. We can presume that NOS play an important physiological role in porcine oocyte ageing.

## Keywords:

nitric oxide; L-NAME; aminoguanidine;  
oocyte ageing; pig

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