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Oral delivery of insulin-loaded nanoparticles in diabetic rabbits and in sheep

S. Olya, M. Khorvash, H.R. Rahmani, B. Olya, H. Sadri

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Citation: Olya S., Khorvash M., Rahmani H.R., Olya B., Sadri H. (2014): Oral delivery of insulin-loaded nanoparticles in diabetic rabbits and in sheep. Czech J. Anim. Sci., 59: 251-256.

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The objective of this study was to produce Eudragit® RS 100 microparticles (ERS) containing insulin (ILNP), and to evaluate the potential of these nanoparticles as a drug carrier for oral administration in alloxan-induced diabetic rabbits and in sheep. After oral administration of ILNP to diabetic rabbits, a significant hypoglycemic effect was observed and this effect lasted for 2 days. Concentrations of blood glucose were significantly decreased in ILNP-treated sheep compared to those in control and ERS groups on day 5 of the experiment. Orally ILNP-treated sheep exhibited higher concentrations of progesterone compared to control and ERS in all sampling times. Sheep in the ILNP group had lower concentrations of cortisol than the animals in the control group on days 1 and 3. However, other blood hormone parameters were not affected by the treatments. The results show that encapsulation of insulin into nanoparticles allows the preservation of its biological activity when going through digestive system of rabbit and sheep to the blood stream.

Keywords:

diabetes; insulin encapsulation; drug delivery; rumen-bypass; glycemia

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