Quality parameters and fertility of ram semen cryopreserved in egg yolk and soybean lecithin supplemented extenders

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Abstract

The aim of the study was to investigate the effect of soybean lecithin as a substitute for egg yolk in milk and tris based extenders in ram semen cryopreservation. Twenty ejaculates were collected from four healthy, mature Wrzosówka rams (2-3 years of age). Each ejaculate was divided into four equal aliquots and diluted with four different extenders: 1) milk extender containing 5% egg yolk, 2) milk extender containing 1.5% soybean lecithin, 3) tris extender containing 20% egg yolk, 4) tris extender containing 1.5% soybean lecithin. Extended semen was loaded into 0.25 ml French straws, cooled and frozen in liquid nitrogen vapor. Total motility, curvilinear velocity, plasma membrane integrity and fertilizing ability of sperm were assessed after thawing. Total motility was lower (p<0.05) in tris-soybean lecithin extender when compared to other extenders. Curvilinear velocity was higher (p<0.05) for spermatozoa cryopreserved in milk-soybean lecithin extender compared to other extenders tested. For the percentage of live sperm no significant difference was observed between extenders. The lambing rate were higher (not statistically significant) in ewes inseminated with semen doses frozen in milk-soybean lecithin extender (42.9%) than in the tris-egg yolk extender (16.7%). In conclusion, replacing the egg yolk with soybean lecithin was effective in milk but not in tris extender.

Key words: ram semen, cryopreservation, soybean lecithin, sperm quality, fertility

Introduction

Soybean lecithin is considered to be a chemically-defined pathogen-free alternative to egg yolk in semen extenders for cryopreservation of ram spermatozoa. It protects the sperm membrane by stabilizing and replacing phospholipids, thus increasing tolerance to the freezing process. During the cryopreservation of ram semen, tris extender supplemented with 1.5% soy lecithin enhance most semen quality parameters (Forouzanfar et al. 2010, Emanverdi et al. 2013). Nevertheless, the negative effect of soybean lecithin on sperm motility and mitochondrial activity has also been observed in frozen-thawed ram semen (Del Valle et al. 2012, Mata-Campuzano et al. 2015). To our knowledge, the effect of replacing egg yolk with soybean lecithin in a milk extender has not been studied so far. The aim of this study was to investigate the effect