Original article

Production and characterization of egg yolk antibodies against bovine alimentary tract pathogens

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Abstract

Aim of the study was to evaluate the effect of immunization of hens with bovine vaccines (C, R, T) on the course of IgY antibodies production against selected bovine E.coli strains, rota- and coronaviruses in egg yolk in farm conditions. The hens (40 individuals per group) were vaccinated twice, subcutaneously in four week interval and eggs were harvested once a week. Control group consisted of eggs sampled from non-vaccinated hens located in neighbouring cages. The antibody activity was measured by ELISA. All used vaccines induced the rise of IgY antibody in egg yolks. Based on the duration and the highest level of IgY antibody against bovine alimentary tract pathogens C vaccine was further used in next two trials for vaccination of 1000 hens each time. Double immunization seems to be enough in mounting response against examined pathogens for several weeks. Immunization with C vaccine allowed to harvest eggs with satisfactory levels of E.coli, rotavirus and coronavirus IgY antibodies which may be used to evaluate their protective effect by oral administration in calves.

Key words: vaccination, hens, calf diarrhoea, Escherichia coli, rotavirus, coronavirus, IgY

Introduction

Neonatal calves’ diarrhoea is one of major problems in dairy calves from birth to 90 days of life (Svensson et al. 2003). Economic importance of diarrhoea is associated with significant costs of treatment and decreased weight gain, increased susceptibility to other diseases and lowered number of heifers available to reproduction (Halawa and Stefaniak 2002, Furman et al. 2011). Alimentary tract infections in calves are caused mostly by type A rotaviruses in about 60% of cases, less commonly by enterotoxigenic E.coli, coronaviruses and other pathogens. Cryptosporidium parvum is identified commonly, but rarely as the primary cause (Thomson et al. 2007, Bartels et al. 2010).

Vaccination of pregnant cows against the most common bacterial and viral pathogens of neonatal calves’ alimentary tract induce several fold increase of antibody (Ab) concentration in colostrum (Acres et al. 1979, Snodgrass et al. 1980). Unfortunately, their concentration decreases rapidly in milk and after few