INTRODUCTION

It is now well established that oestrogen and progesterone are absolutely essential for mammary gland development. Lactation can be induced in non-pregnant animals by sex steroid hormone treatment. Most of genomic actions of oestrogens are mediated by two receptor (PR). The aim of the presented paper was to study expression of ER

RESULTS AND DISCUSSION

The quantitative mRNA expression (LightCycler RT-PCR) of the steroid hormone receptors ERα, ERβ and PR in the bovine mammary gland at different stages of development and function are shown in Figure 1 and Table 1. In general highest mRNA expression for ERα and PR in f/t/ug total RNA range is found during early mammogenesis in non-pregnant heifers followed by a significant decrease to lower levels at the time of lactogenesis with remaining low concentrations during lactation and the first 4 weeks of involution. In contrast, expression of ERβ is about 1000-fold lower (ag/µg) range and shows no clear difference during the stages examined followed by a significant increase 2-4 weeks of involution.

Immunolocalisation with a monoclonal antibody for ERα (Fig. 2) revealed a strong positive staining in nuclei of lactocytes in non-pregnant heifers, became undetectable during pregnancy, lactogenesis, lactation, and was once again detectable 14-28 d after dry off. In contrast, the PR is localised (Fig. 3) in nuclei of lactocytes in mammary tissue of heifers, pronounced in nuclei of basal epithelial cells in primigravid animals. During lactogenesis less nuclei of epithelial cells were positive, but increased staining of cytoplasm of epithelial cells is obvious. The staining intensity and localisation is similar during peak and mid lactation followed by a change during late lactation and involution where staining is now observed again in nuclei of epithelial cells.

Table 1: Real-time RT-PCR mRNA expression of oestrogen receptor α (ERα), ERβ and progesterone receptor (PR) in bovine mammary gland tissue. Results (concentration of specific mRNA / µg total RNA) represent means ± SEM from n = 4 - 6 groups. (II) Mammogenesis (non-pregnant heifer); (II) lactogenesis (4-8 post partum); (III) galactopoiesis, (IIIA) early (2-8 weeks); (IIIB) middle (4-5 months); (IIIC) late (8-12 months) and (IIID) involutions (8-12 months and IIIId) involutions (96-108h and 14-28d after dry off of non pregnant cows)

CONCLUSIONS

In conclusion, the mRNA expression and localisation data for ER and PR show clear regulatory changes suggesting involvement of these receptors in cow mammary gland development and remodelling.