

Introduction

- Endoparasite infections can lead to considerable economic losses in dairy cattle due to decreases in milk yield and quality.
- Environmental and host-related factors contribute to endoparasite infection intensity and probability.
- Advancing urbanization influences parasite infection dynamics in livestock due to close human-animal cohabitation and changes in management and animal housing conditions (Fig. 1).

Aim of the study

- To investigate social-ecological effects on infections with gastrointestinal nematodes (GIN) and *Eimeria* spp. in dairy cattle along a survey stratification index (SSI) that signifies the level of urbanization in Bangalore, India.

Methodology

- To count once every 4 months the n° of GIN eggs per gr faeces (EpG) and *Eimeria* spp. oocysts (OpG).
- McMaster technique with 4 gr faeces and saturated NaCl as flotation solution.
- SSI comprised built-up density and distance to the city center.

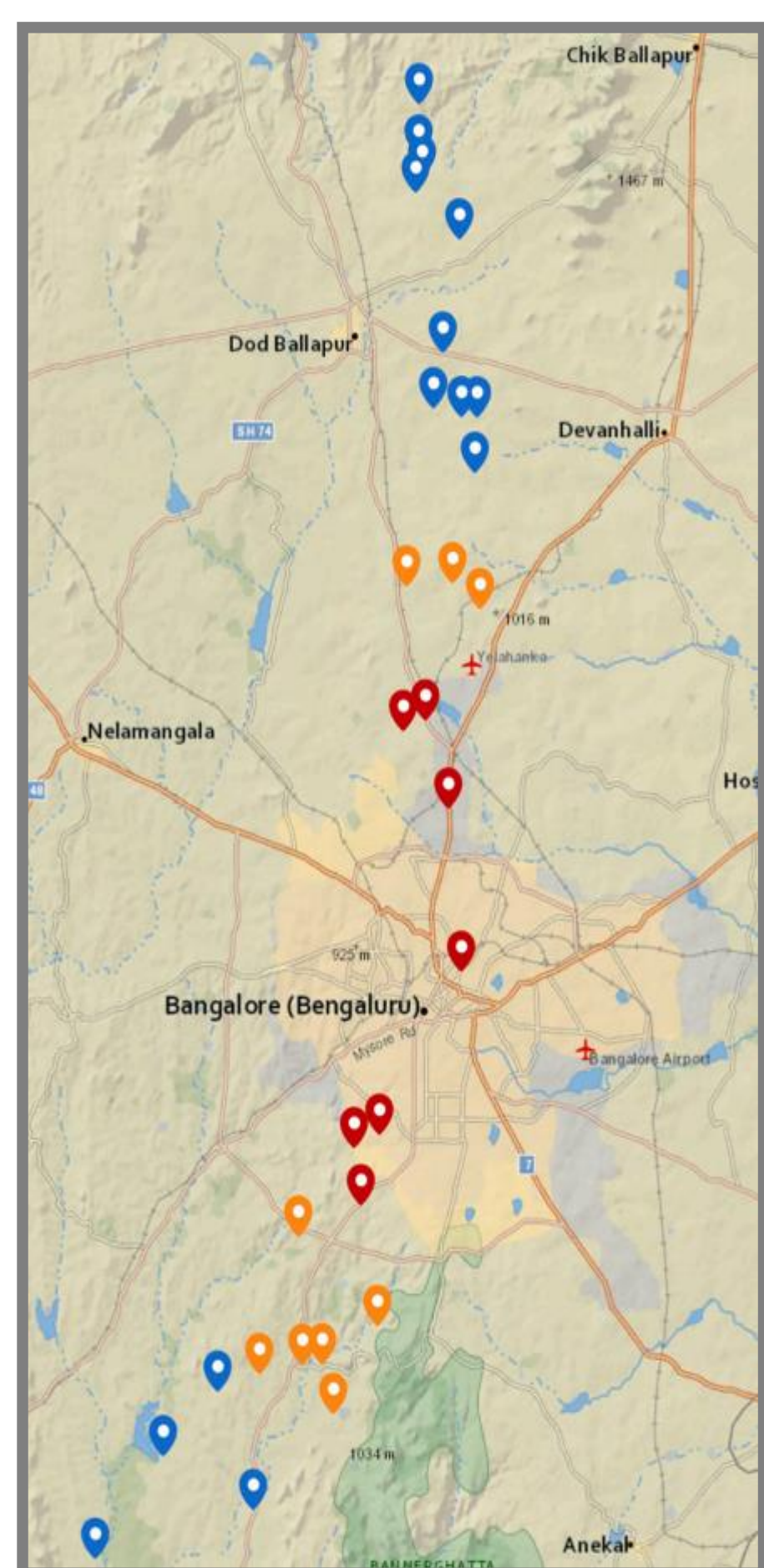


Fig. 2 Map and SSI classification of the 30 villages sampled (urban, mixed and rural)

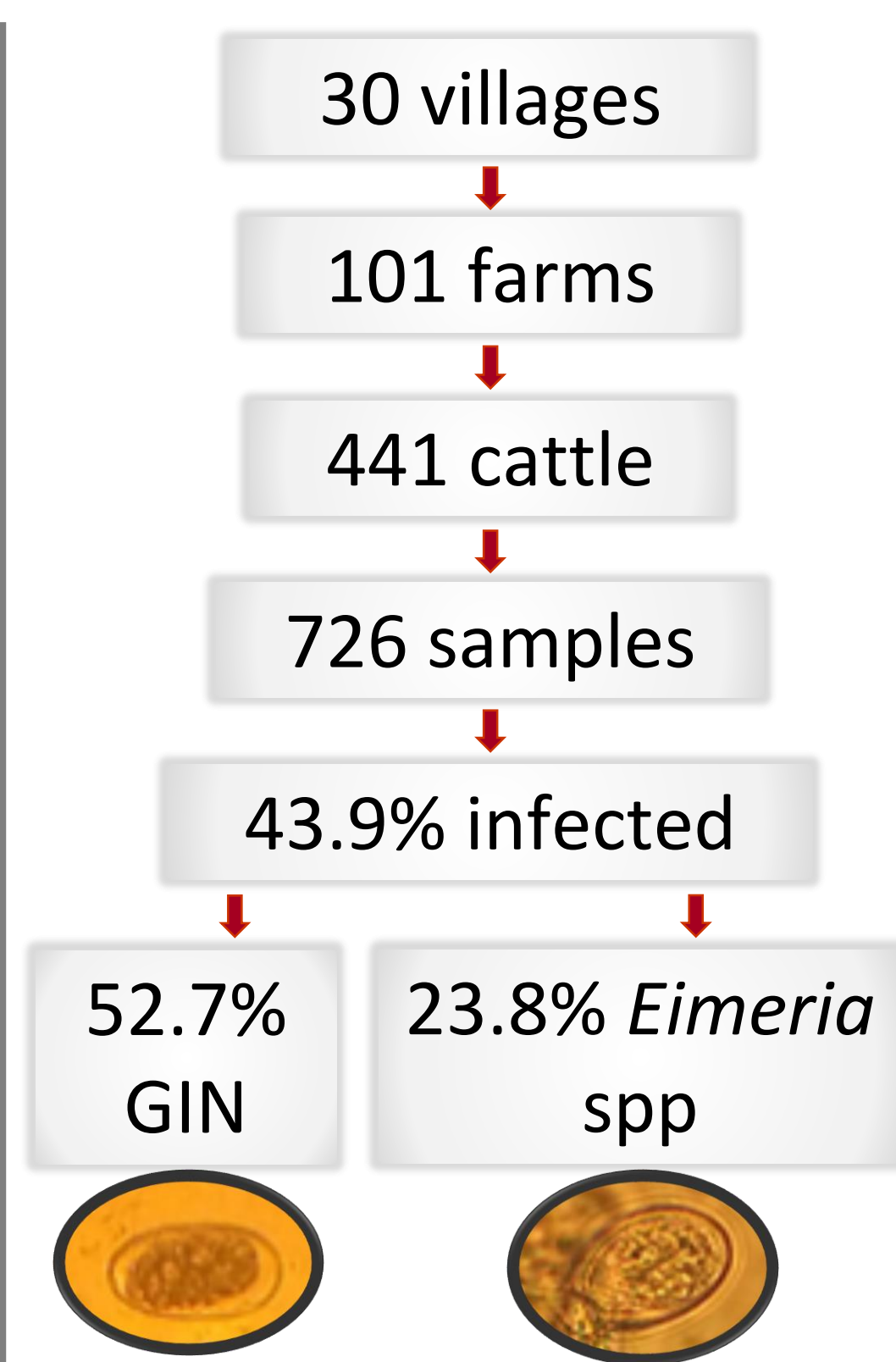


Fig. 3 Representative methodology scheme



Fig.1 Shed location of an urban farm (top) and a rural farm (bottom)

Highlights

- The close cohabitation of humans and livestock as a result of rapid urbanization encourages a better animal health management, and decreases the risk for *Eimeria* spp. infections.
- Variations in protozoal infection intensity and probability observed along the SSI of Bangalore reflect the variability in dairy husbandry systems governed by the social-ecological context.

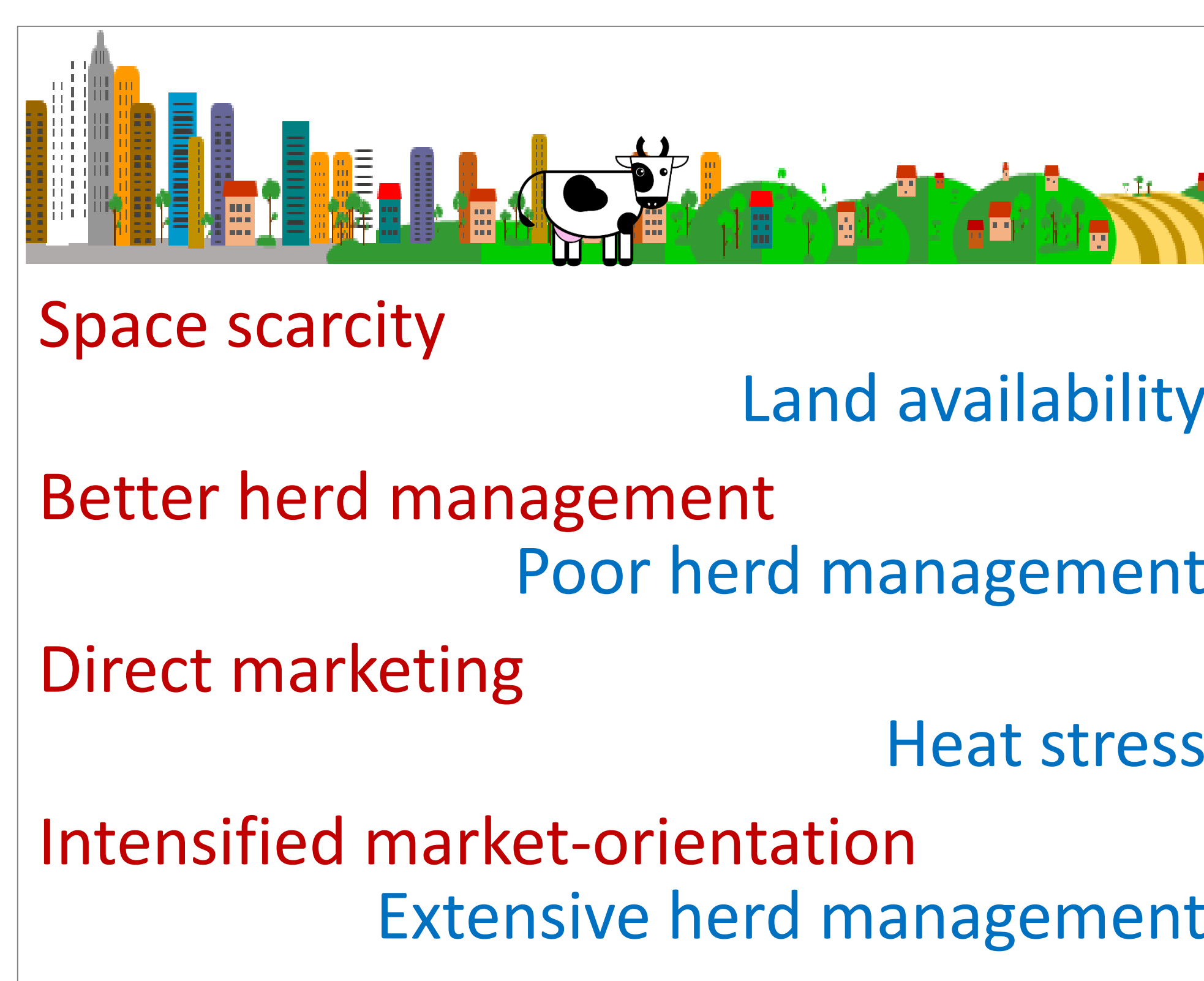


Fig. 6 Social-ecological components at the farm location (urban and rural) affect livestock health

Results

The SSI effect:

- Significantly influenced *Eimeria* spp. infection probability and the oocyst counts ($P < 0.001$), both being higher in rural areas (Fig. 4, 5).
- GIN infection probabilities and EpG were unaffected by SSI (Fig. 4, 5).

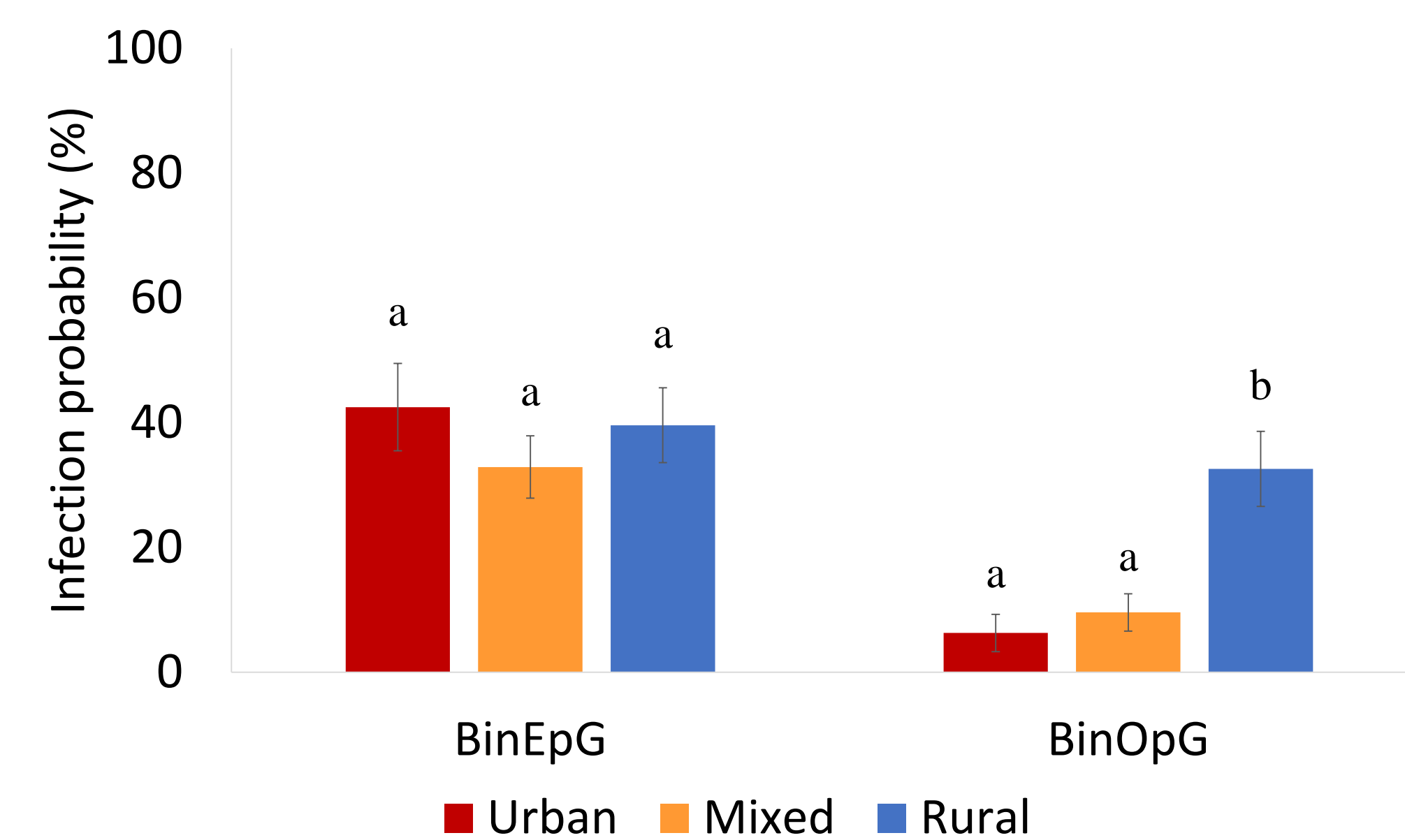


Fig. 4 LSMeans and SE for infection probability with GIN (BinEpG) and *Eimeria* spp. (BinOpG) within the SSI classes

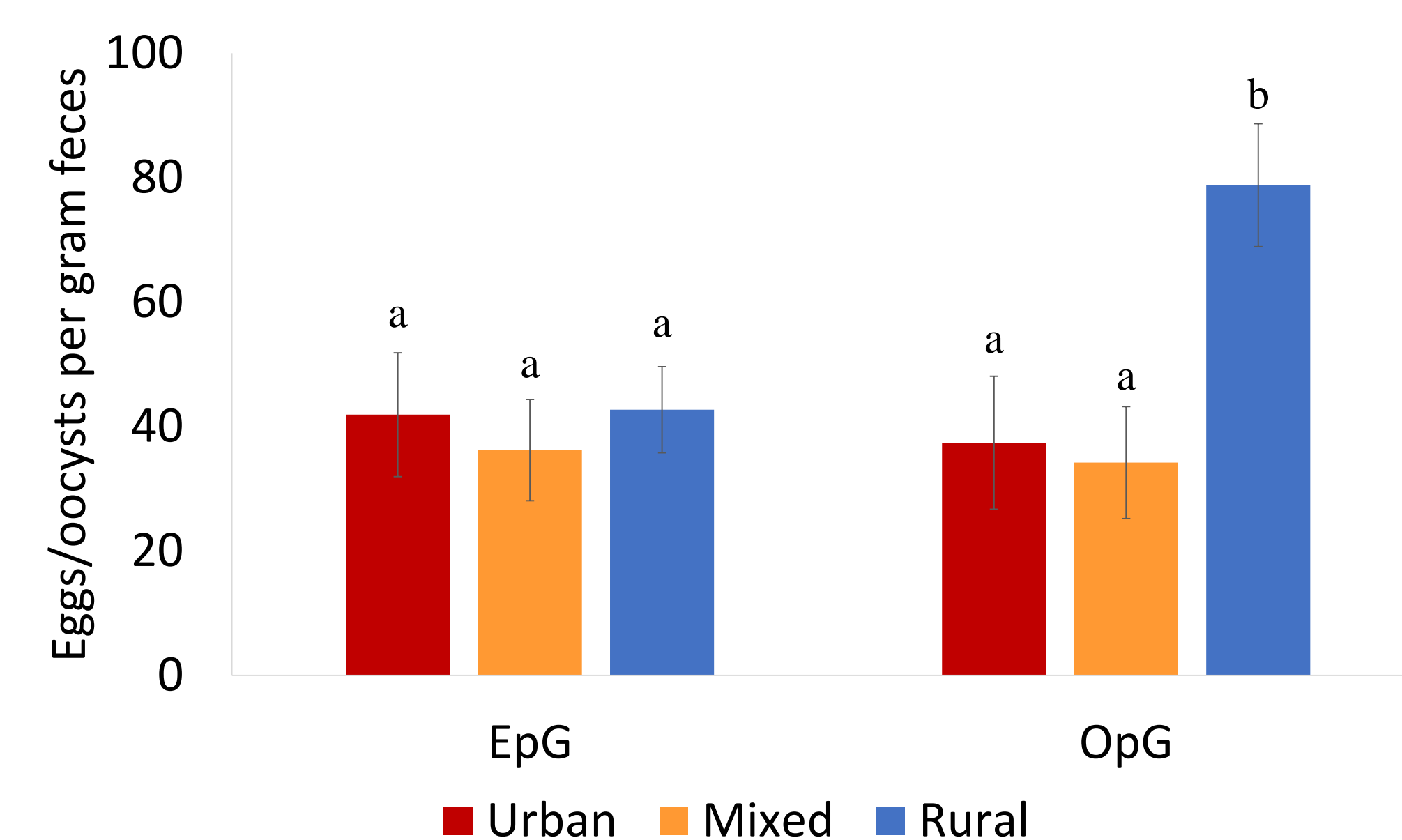


Fig. 5 LSMeans and SE for n° of GIN eggs (EpG) and *Eimeria* spp. oocysts (OpG) per gram faeces within the SSI classes

Discussion

- GIN might be better adapted to urban environments with less impairment on the parasite's life cycle compared to protozoan parasites.
- The survival conditions are favorable for both parasite species in rural environments.
- Differences in in/output access, farm management and habitat resources might result in impaired resistance in animals from urban compared to rural farms (Fig.6).

