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INTRODUCTION

Meat is worldwide known to be a nutrient rich food. It provides valuable amounts of proteins, vitamins such as retinol and vitamin B12 and minerals namely iron, selenium and zinc with an increased bioavailability than found in other dietary sources [1]. Along the production chain, meat can get contaminated by a wide range of spoilage and/or pathogenic microorganisms from the farm, slaughtering environment and distribution. The actual number of foodborne infections attributable to meat is difficult to assess accurately, principally because only a small proportion of illness cases is officially reported. However, by using outbreak data published internationally, Greig and Ravel [2] reported that 12.7 % of reported foodborne outbreaks were attributable to beef while 10.5 and 4.6 % were associated with chicken and pork, respectively. According to the same authors, *Salmonella* spp. and pathogenic *E. coli*, respectively, were identified as the causal agents in 32.9 and 34.6 % of foodborne outbreaks of bacterial origin attributable to beef. The objective of this study was to determine the meat consumption pattern in different socio-economical categories of the population of Kigali city and to assess the bacteriological quality of the consumed meat.

MATERIAL AND METHODS

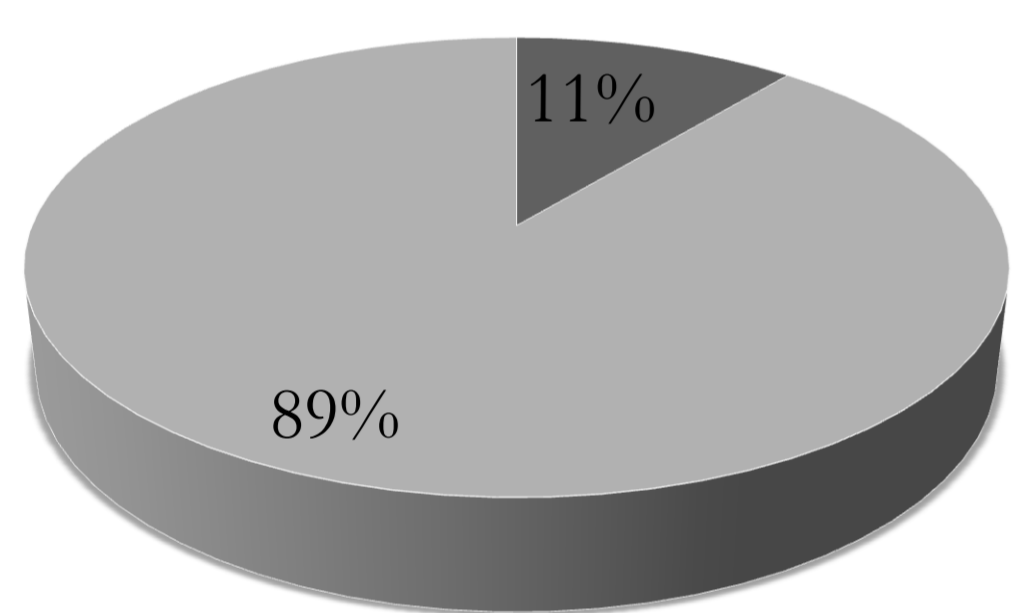
Survey on meat consumption: The survey on meat consumption was conducted in 400 households representative of the population of Kigali city by using a structured questionnaire.

Bacteriological analyses of meat samples: Fresh and cooked meat samples were analyzed for the total mesophilic count (TMC) according to the ISO 4833:2003 Standard protocol, *Escherichia coli* count (ECC) by using the ISO 16649-2:2001 standard protocol and *Salmonella* detection by following the following the ISO 6579:2002 standard protocol.

MEAT CONSUMPTION AT THE HOUSEHOLD LEVEL

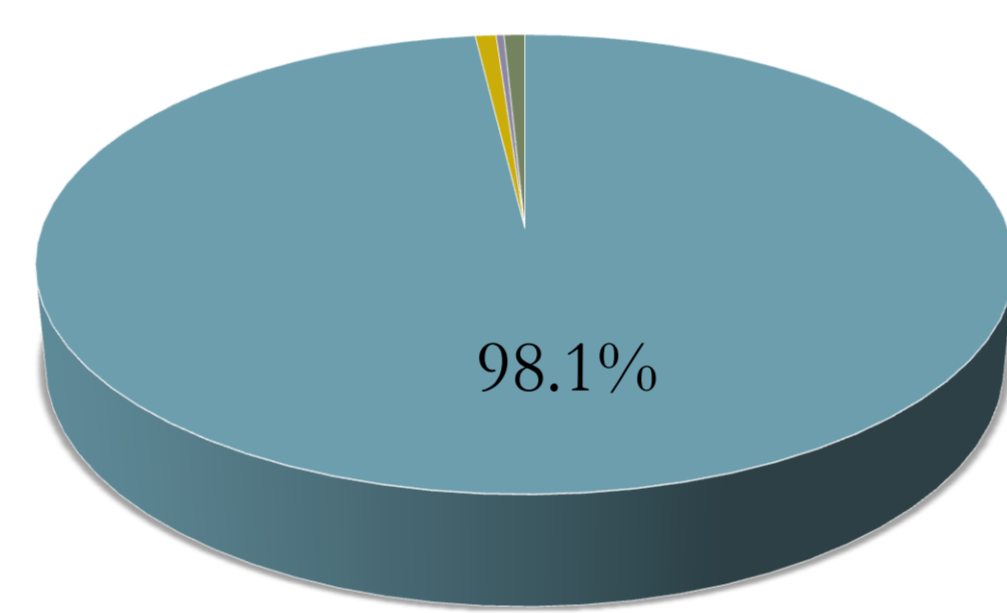
Meat consumption status

■ Non consumption ■ Consumption



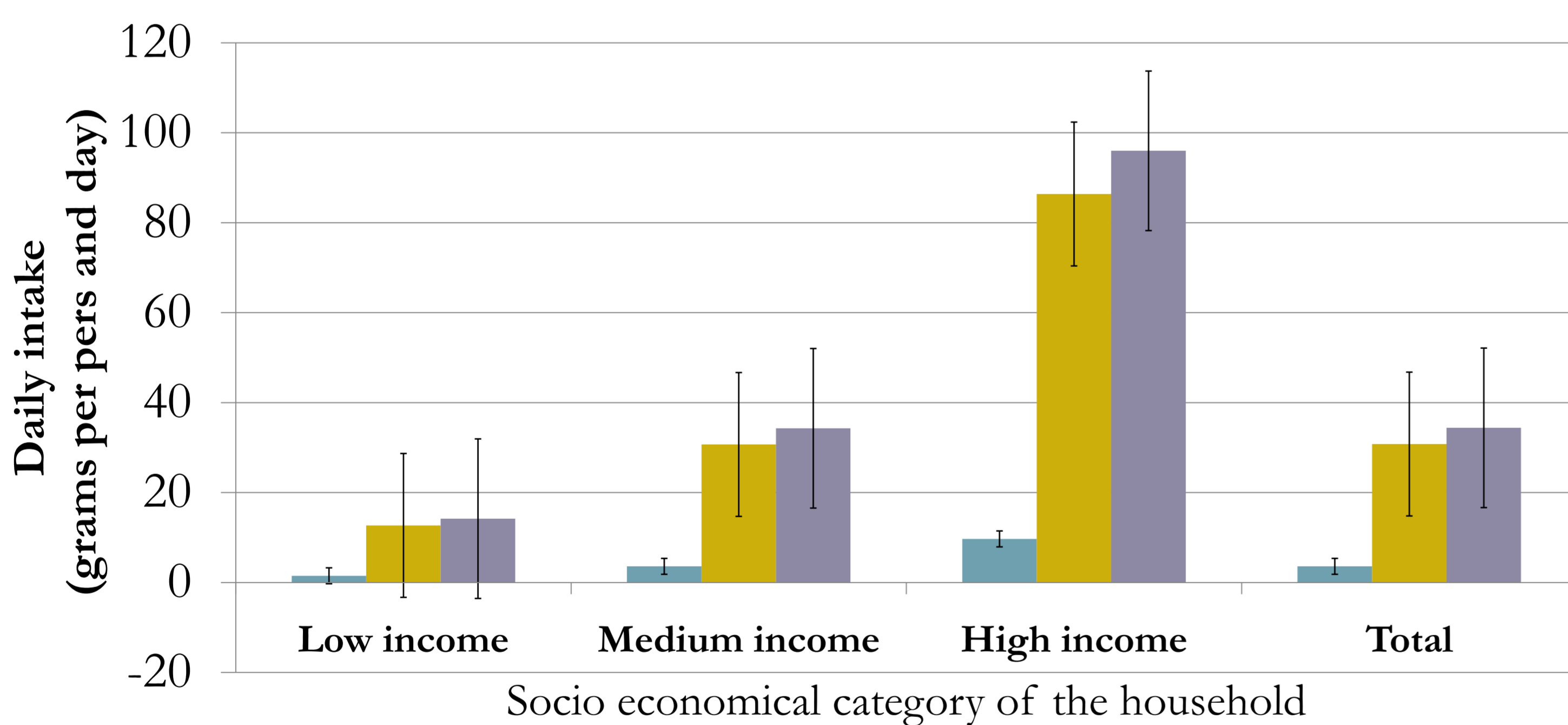
Meat Type Preference

■ Bovine ■ Goat/Mutton ■ Pork ■ Chicken



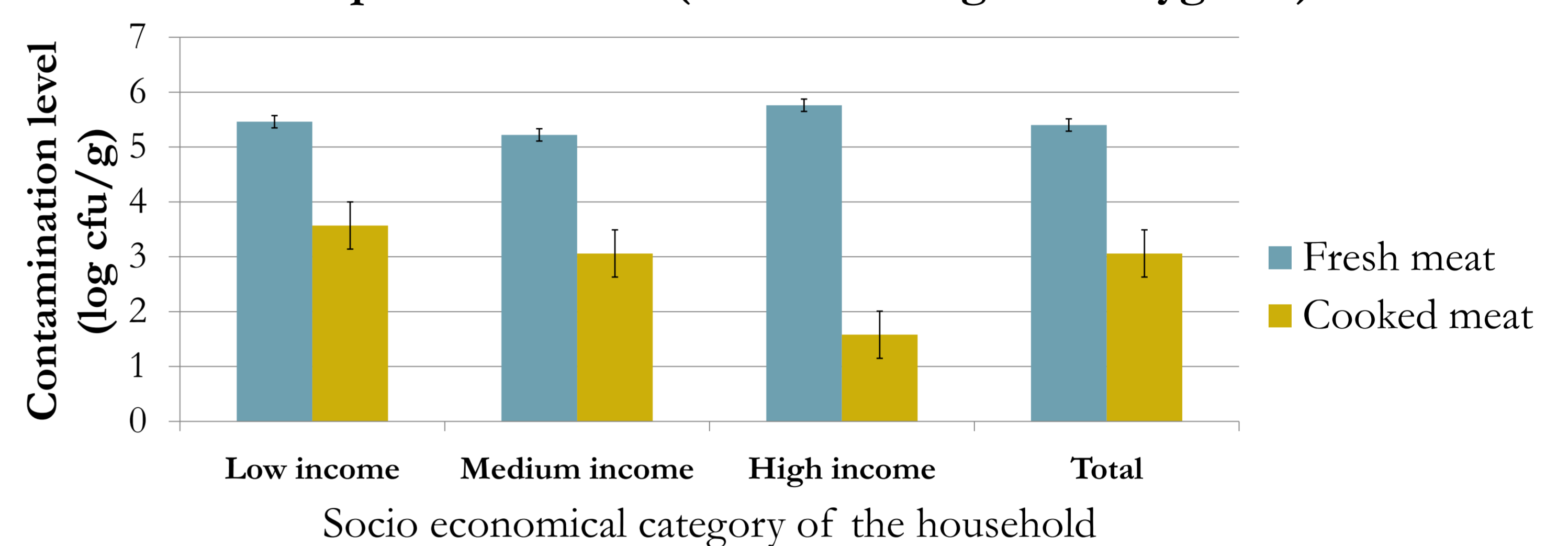
Meat daily intake (MDI) in the households

■ Offals ■ Lean meat ■ Total

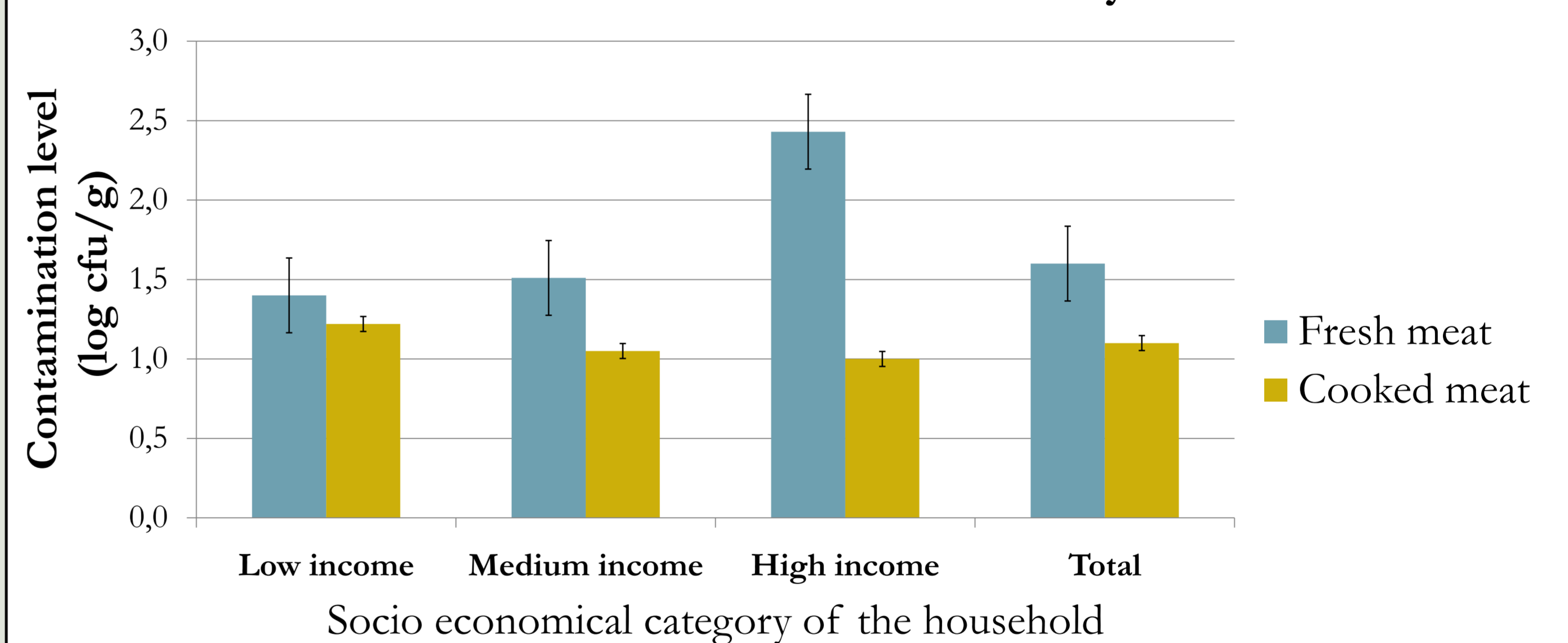


BACTERIOLOGICAL QUALITY OF MEAT

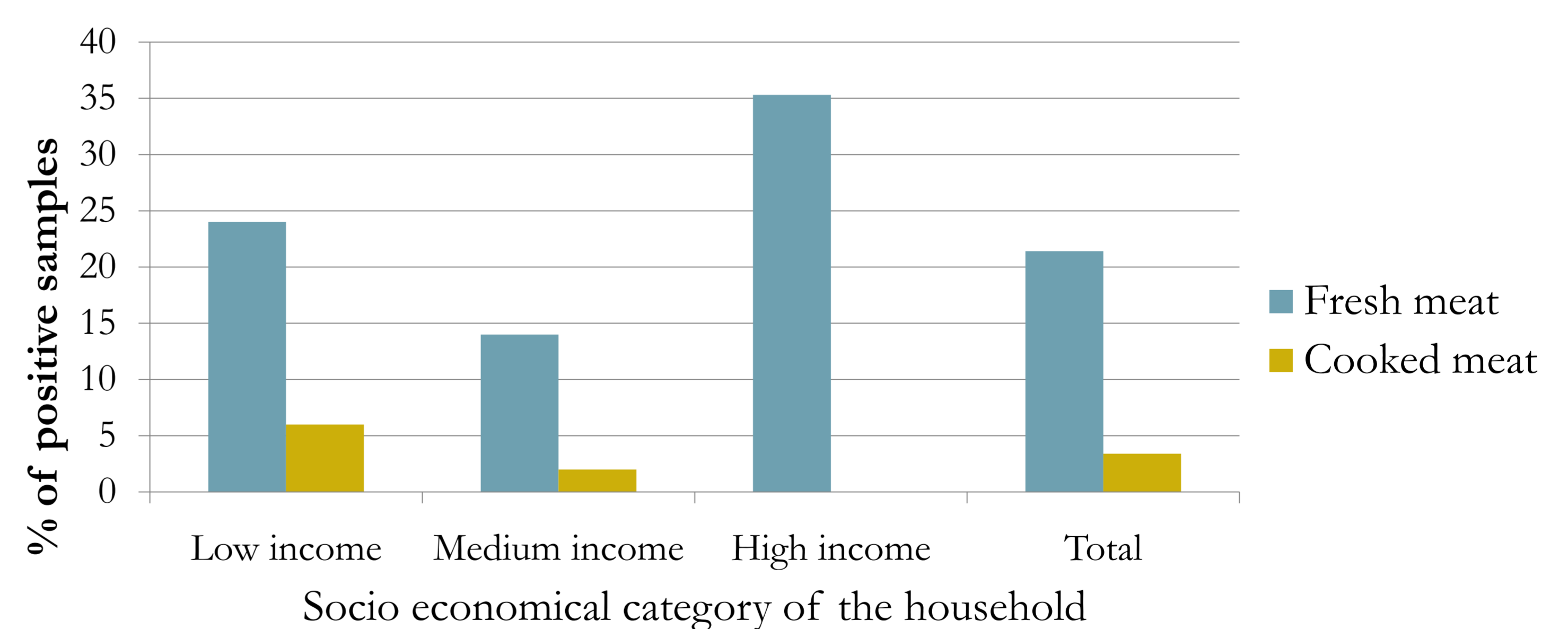
Levels of bovine meat contamination by Total Mesophilic Bacteria (Indicator of general hygiene)



Levels of bovine meat contamination by *E. coli*



Presence of *Salmonella* spp. in fresh and cooked meat



[1] McAfee et al., 2010. Red meat consumption: an overview of the risks and benefits. *Meat Sci.* **84**:1–13.

[2] Greig JD, Ravel A. 2009. Analysis of foodborne outbreak data reported internationally for source attribution. *Int. J. Food Microbiol.* **130**:77–87.

DISCUSSION

From this study, meat is consumed by the majority of the population in Kigali city and beef constitutes the favorite meat type consumed in the households. The preference for beef could be explained by the important value of bovines in the Rwandan culture.

The high levels of hygiene indicator bacteria and the prevalence of *Salmonella* in fresh meat is attributable to poor hygienic practices in meat selling places and/or in earlier stages of the meat chain. The significant reduction of hygiene indicator bacteria and the prevalence of *Salmonella* in cooked meat reflect the importance of the cooking stage in the control of pathogenic bacteria that could be transmitted to humans through the consumption of contaminated meat. The presence of *Salmonella* in cooked meat could be the result of a post cooking contamination of meat based meals.

CONCLUSIONS

Bovine meat constitutes the type of meat mostly consumed in all categories of Kigali city households. The observed high levels of hygiene indicator bacteria and the prevalence of *Salmonella* in fresh meat calls for the improvement of hygienic practices in meat handling in selling places and/or in earlier stages of the meat chain. Furthermore, the presence of *Salmonella* in cooked meat highlight the need for proper cooking and/or hygiene improvements especially in poor households.

ACKNOWLEDGEMENTS

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