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MEAT CONSUMPTION OUTSIDE THE HOUSEHOLD AND RISK FACTORS FOR SALMONELLA CONTAMINATION IN MEAT BASED DISHES IN KIGALI, RWANDA.

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INTRODUCTION

Meat is world widely 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. *Salmonella* is reported to be the causal agent of 33 % of food borne outbreaks of bacterial origin attributable to meat [2]. Previous studies have indicated a *Salmonella* prevalence of 3.4% in meat based dishes consumed within the households of Kigali. However, the consumption pattern as well as the prevalence of *Salmonella* in meat based dishes consumed outside the household is still unknown. The objective of this study was to determine the meat consumption pattern outside the household's level and to assess the bacteriological quality of the consumed meat based dishes.

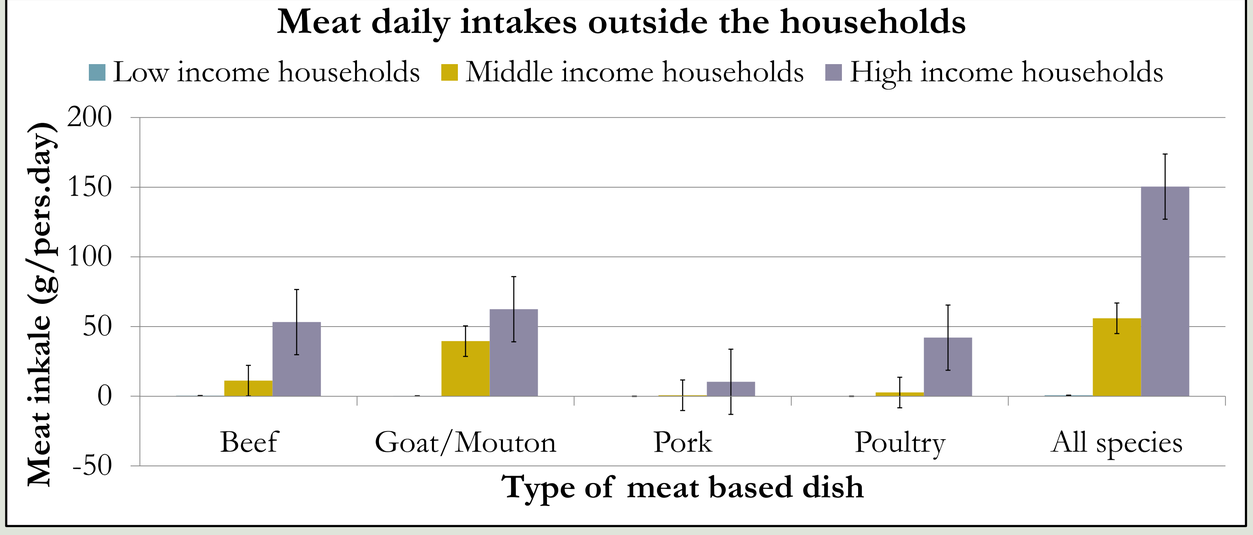
MATERIAL AND METHODS

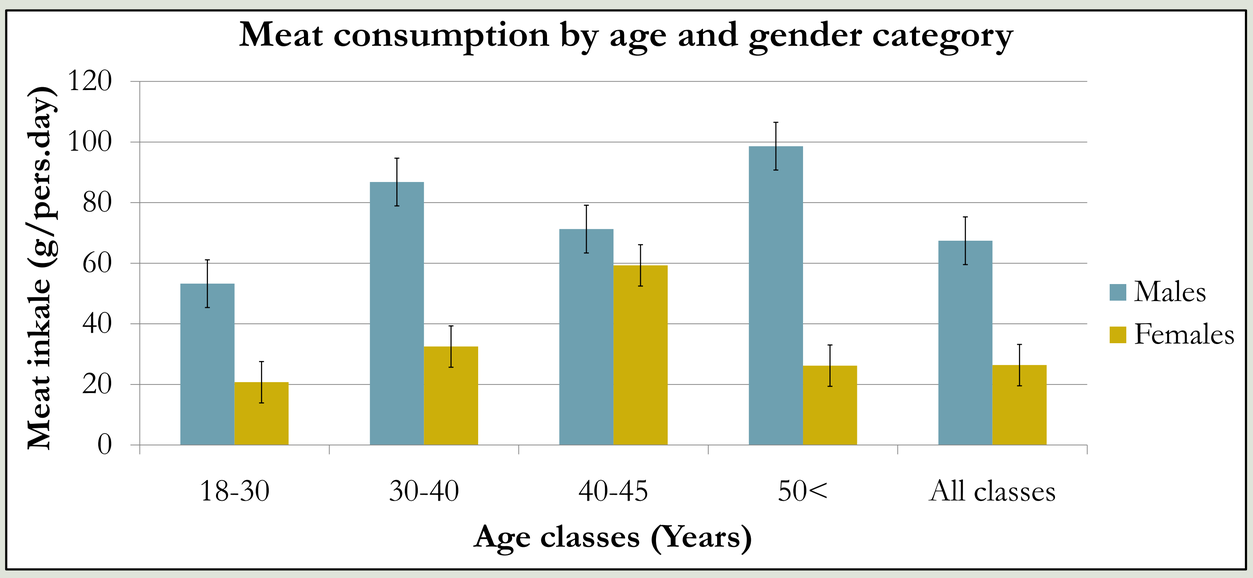
Survey on meat consumption: The survey on meat consumption was conducted in 357 households representative of the population of Kigali by using a structured questionnaire.

Bacteriological analyses: Meat based dishes were analyzed for *Salmonella* detection by using the ISO 6579:2002 standard protocol.

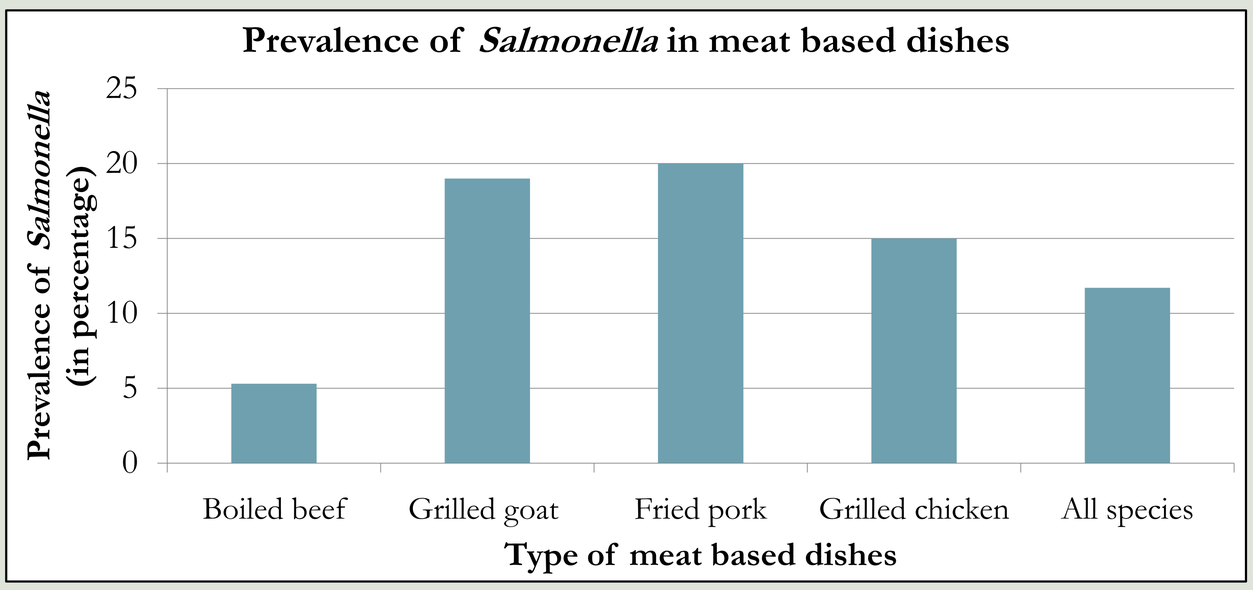
Determination of risk factors: Informations on meat hygiene were collected from 150 bars and restaurents through a structured questionnaire. The binary logistic regression analysis was used to detemine the factors associated to the contamination of meat based dishes by *Salmonella*.

MEAT CONSUMPTION OUTSIDE THE HOUSEHOLD





SALMONELLA IN MEAT BASED DISHES



[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.

RISK FACTORS FOR SALMONELLA CONTAMINATION

Variable	Percentage of *Salmonella* positive establishments	Binary logistic regression		
		OR	95% CI	p-value
Type of the establishment selling meat based dishes				
Snack-bar	29.3	4.774	1.81-12.61	0.001
Restaurant	8.0	1		
Changing knife to cut meat from different animal species and non-meat ingredients				
Yes	3.0	1		
No	23.1	9.600	1.25-73.56	0.009
Cooking method for meat based dishes preparation				
Boiling	8.0	1		
Grilling	28.3	4.547	1.66-12.43	
Frying	33.3	5.750	1.48-22.39	0.003
Estimated duration of the cooking process				
30-45 min	30.1	1		
45-60 min	8.3	1		
60 min<	7.7	0.193	0.07-0.55	0.002
Previously cooked foods and only reheating at consumption				
Yes	7.6	0.217	0.08-0.61	0.002
No	27.4	1		
Only once a day	36.8	1		
Several times a day	7.5	0.140	0.06-0.36	0.032
Specific work clothing for personnel				
Yes	4.5	1		
No	24.5	6.825	1.54-30.16	0.004
Presence of measures against vermin in the establishment				
Yes	6.8	1.0		
No	30.7	5.989	2.14-16.80	0.000

MAIN FINDINGS

Meat based dishes are regularly consumed outside the household's circle in Kigali although the consumed quantity appears to be low especially in low income households. Goat brochettes constitute the mostly consumed meat based dish. The prevalence of *Salmonella* in meat based dishes sold in bars and restaurants of Kigali was found to be relatively high. Seven risk factors for *Salmonella* contamination of meat based dishes were identified and most of them dealt with hygienic practices.

Therefore, there is a need to improve hygienic meat handling and cooking practices in the snack-bars and restaurants of Kigali in order to limit the transmission of bacterial pathogens to humans through the consumption of contaminated meat. Furthermore, the control of the establishments selling meat based dishes by the competent authorities need to be enhanced particularly in rural establishments.

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