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Understanding meat consumption patterns and use of naturally occurring food additives (NOFA) in urban Rwanda

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Abstract

Background: Rwanda has the highest population density in Africa and is expanding its poultry sector as a food security strategy; however, this sector remains underdeveloped, with critical food safety infrastructure largely absent, increasing the risk of microbial contamination. Food preparation practices, including cooking culture, storage methods, and ingredient choices, directly influence pathogen presence, survival, and transmission. Although antimicrobial properties of certain herbs and spices have been confirmed, evidence on their systematic use in low-resource settings is lacking.

Objective: To examine the socio-cultural, economic, and behavioural factors influencing meat consumption and handling in Rwandan communities, and to identify the use of naturally occurring food additives (NOFA), including herbs, spices, and natural sanitisation, as well as their perceived efficacy and potential for adoption in food safety interventions.

Methods: A qualitative research design was employed. A total of six focus group discussions (FGDs) with 48 participants from diverse demographic and socioeconomic backgrounds in urban Rwanda were held. Thematic analysis was conducted using a coding process, performed both manually and using NVivo software, to identify key patterns, themes, and sub-themes.

Results: Five major themes emerged: A widespread use of natural substances (garlic, lemon, ginger, vinegar) with perceived antimicrobial and preservation roles; prevalent use of commercial condiments (“maggi”, soy sauce, “masala” blends); a culturally embedded multi-stage cooking sequence serving implicit food safety functions; and beef as the dominant meat consumed primarily twice weekly, with cultural variation by occasion. Significant food safety concerns were reported, including retail hygiene deficiencies, lack of cold chain during transport, and, in some areas, absence of poultry abattoirs with limited regulatory inspections.

Conclusion: Urban Rwandan households demonstrate meat preparation practices that integrate natural and commercial additives while maintaining inherent food safety functions. Significant food safety gaps exist. These findings provide a novel qualitative evidence base to inform culturally appropriate food safety interventions, NOFA-based antimicrobial strategies, and public health policy in Rwanda.

Significance: This research is among the first systematic social science studies on meat consumption and traditional food safety practices in Rwanda, providing foundational evidence to support evidence-based food safety regulation, nutrition programmes, and NOFA-focused public health interventions in sub-Saharan Africa.

Keywords: Antimicrobial herbs, focus groups, food safety, meat consumption, naturally occurring food additives, NOFA, qualitative research, Rwanda, traditional spices, urban food practices