



FOOD SAFETY RISK ASSESSMENT IN BEEF IN ARUSHA MUNICIPALITY, TANZANIA

Presenter: Edgar Mahundi

Authors



E. Mahundi¹, Prof. L. Kurwijila², E. Karimuribo³,
K. Makita^{4,5}, H. Ngowi³, D. Grace⁴

¹Tanzania Food and Drugs Authority

²Department of Animal Science and Production, SUA

³Department of Veterinary Medicine and Public Health,
SUA

⁴International Livestock Research Institute (ILRI)

⁵ Rakuno Gakuen University, Japan

Introduction



- Thermophilic *Campylobacter* is one of the most important pathogens causing food borne illness in the world
- In Tanzania, the risks of campylobacteriosis had not been studied and the risks especially from informally marketed foods had not been assessed

Cont'd...



- A study on risk assessment for thermophilic *Campylobacter* infection through the consumption of ready to eat beef in Arusha, Tanzania was carried out from January to March 2010
- A total of 160 samples were collected:
 - beef carcass swabs from butcher shops (n=73)
 - 1 g samples of roast beef (n=45) and skewer beef (n=42) sold in beer bars





Justification



- 80% of the population depend on informal market as source of food
- Arusha has 1,523,238 heads of cattle and has a modern abattoir, butcher shops and beef selling stations
- Food safety risk assessment had not been done in ready-to-eat beef in Arusha, Tanzania

Objectives



- To assess the consumption of beef contaminated with thermophilic *Campylobacter* in Arusha municipality
- To estimate the risk associated with the consumption of beef contaminated with thermophilic *Campylobacter*

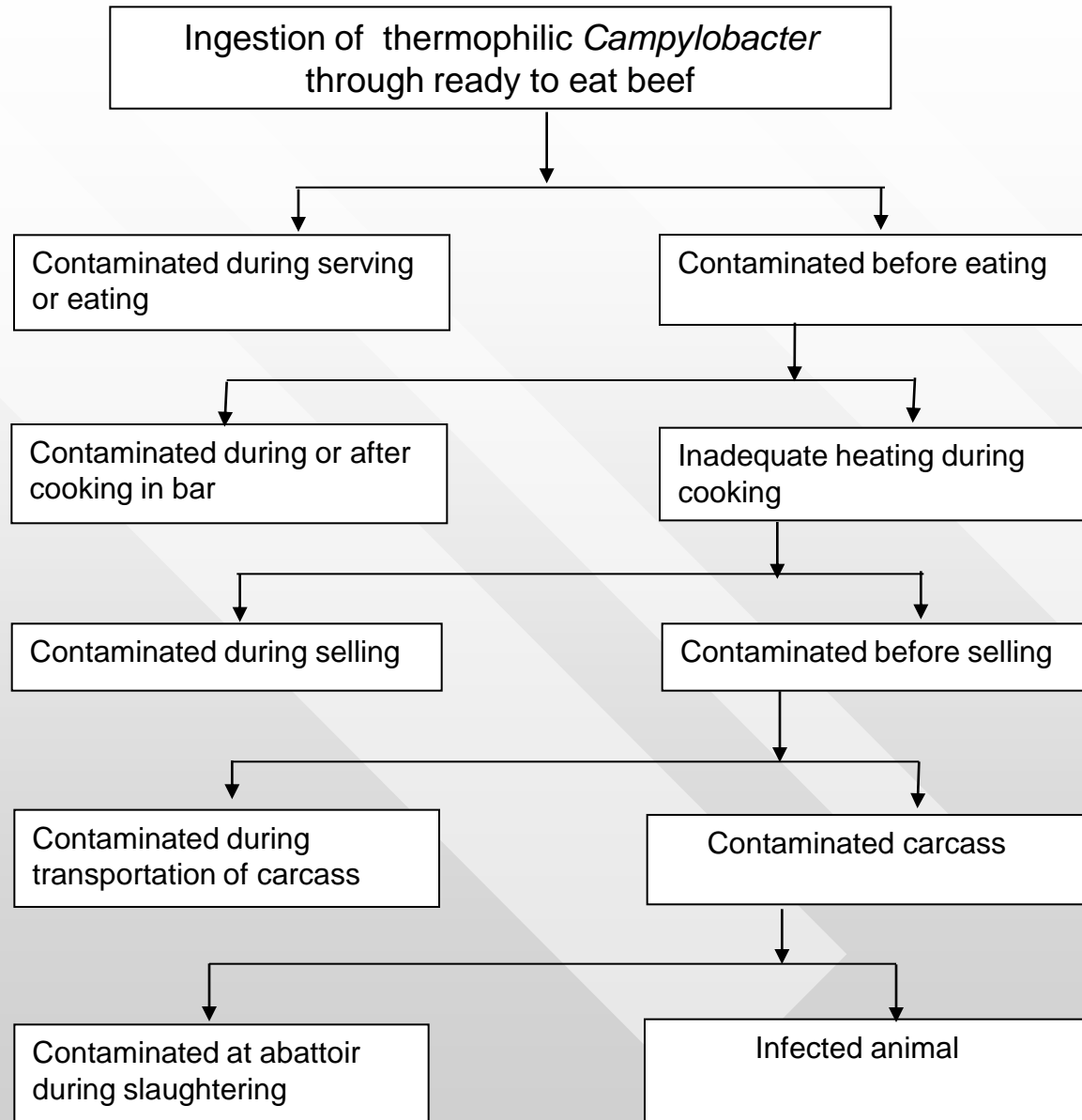
Methodology



- The municipality was divided into two wards, northern and southern
- Participatory methods were applied
- Fault tree was constructed
- Microbiological examination was conducted
- Stochastic modeling was carried out using Monte Carlo

Cont'd





Results



Isolation of thermophilic *Campylobacter* in raw beef, roast beef and skewer beef

Type of Product	Ward	No. sampled	No. positive	Prevalence %
Raw beef	Northern	41	1	2
	Southern	32	8	25
Roast beef	Northern	21	1	5
	Southern	24	7	32
Skewer beef	Northern	20	3	15
	Southern	20	7	35

Exposure assessment for thermophilic *Campylobacter* in roast and skewer beef in beer bars in Arusha, Tanzania



Parameter	Result – stochastic model		
	Mean	5%	95%
Total quantity of <i>roast beef</i> contaminated per day	3,595 kg	1,745 kg	6,133 kg
Total quantity of <i>roast beef</i> consumed per day	23,152 kg	16,811 kg	30,049 kg
Probability of eating contaminated <i>roast beef</i>	15.5%	8.3	24.9
Total quantity of <i>skewer beef</i> contaminated per day	165	57.3	327
Total quantity of <i>skewer beef</i> consumed per day	474	167	837
Probability of eating contaminated <i>skewer beef</i>	34.7%	21.3%	49.1%

Focus group discussions with consumers



R
I
S
K

I
N
C
R
E
A
S
E

- Beef was their favourite meat (78%)
 - Beef consumption at household 3/wk (75%)
 - Quantity purchased 1 kg (70%)
- Had not received training on food hygiene (75%)
 - Not aware of campylobacteriosis (100%)
- 68% graded beef by looking at fat content and colour only



Cont'd...



R
I
S
K

D
E
C
R
E
A
S
E

- Considered good hygiene was a criterion for food safety assurance (70%)
- Serve food within 30 min after cooking (60%)
- Purchase meat before noon (49%)

Discussion



- This study found that almost all beef products examined in Arusha municipality were contaminated with thermophilic *Campylobacter*.
- Southern wards had higher prevalences in all products suggesting the risk of contracting campylobacteriosis is greater in those wards than in the northern wards.

Cont'd...



- Isolation of thermophilic *Campylobacter* in meat sampled from butcher shops suggests there is contamination of carcasses either
 - at the abattoir or
 - during transportation or
 - at the butcher shop.

Cont'd...

- Probabilities of ingestion described by this study in both roast and skewer beef are significant in magnitude suggesting that consumption of contaminated ready-to-eat beef and/or cross contamination is possible.
- Poor knowledge of food handlers may contribute to high contamination rates

Recommendations



Roast and skewer beef are widely consumed in Tanzania increasing the likelihood of thermophilic *Campylobacter* spp. transmission to humans.

- Therefore it is essential to enforce regular inspection at all selling outlets, LGA`s should allocate enough budget for health officers for inspection activity.

Cont'd...



- Health education for all stakeholders on good hygienic practice regarding food consumption is a useful risk mitigation procedure to ensure and safeguard health of consumers.
- Due to the increasing incidence of HIV-related deaths due to *Campylobacter*, interest in campylobacteriosis research and control should be emphasized.

Thank you!

