

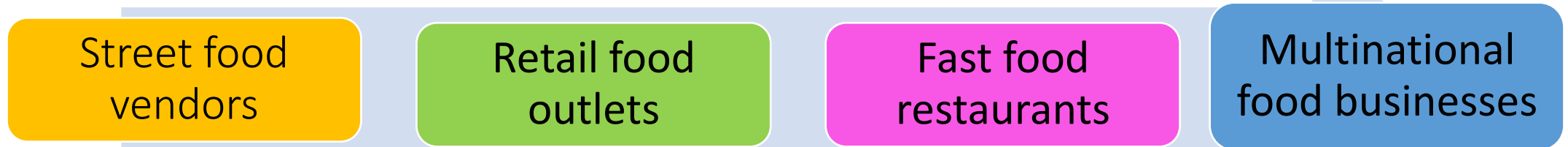
A comparison of the food safety knowledge,
attitude and practices of male and female
foodhandlers employed in fast food restaurants
in Mauritius

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INTRODUCTION

- Trend of globalisation has fostered remarkable transformation in food industry
- Evolution:



- **Restaurants:** structurally adapted premises having at least 40 covers supplying prepared meals and beverages (Tourism Act of Mauritius, 2006)
- Locally restaurants are categorised as chain and independent
- **Chain Restaurants** : multi unit restaurants, local or international including franchised chain that provide standardised products (Scott, 2013)



PROJECT JUSTIFICATION

- **International studies** : conducted to evaluate knowledge, attitude and practices (KAP) on food safety of foodhandlers in restaurants
 - ⇒ Bas *et al.*, 2006; Fadaie, 2015; Rosnani *et al.*, 2014; Al-shabib *et al.*, 2016
- **Local studies:** carried out to assess the level of hygiene prevailing in restaurants
 - ⇒ Daby, 1993, Mohun, 2000, Bundhee 2001, Anazor, 2003, Espiègle 2014, Summun, 2015, Saumtally, 2016
- But scarce information is available on franchise restaurants and on the gender comparison

AIMS AND OBJECTIVES

Specific objectives:



Aim

To investigate whether there is a difference in food safety KAP between male and female food handlers in franchise restaurants locally



To evaluate whether gender affects foodhandlers' KAP in relation to food safety

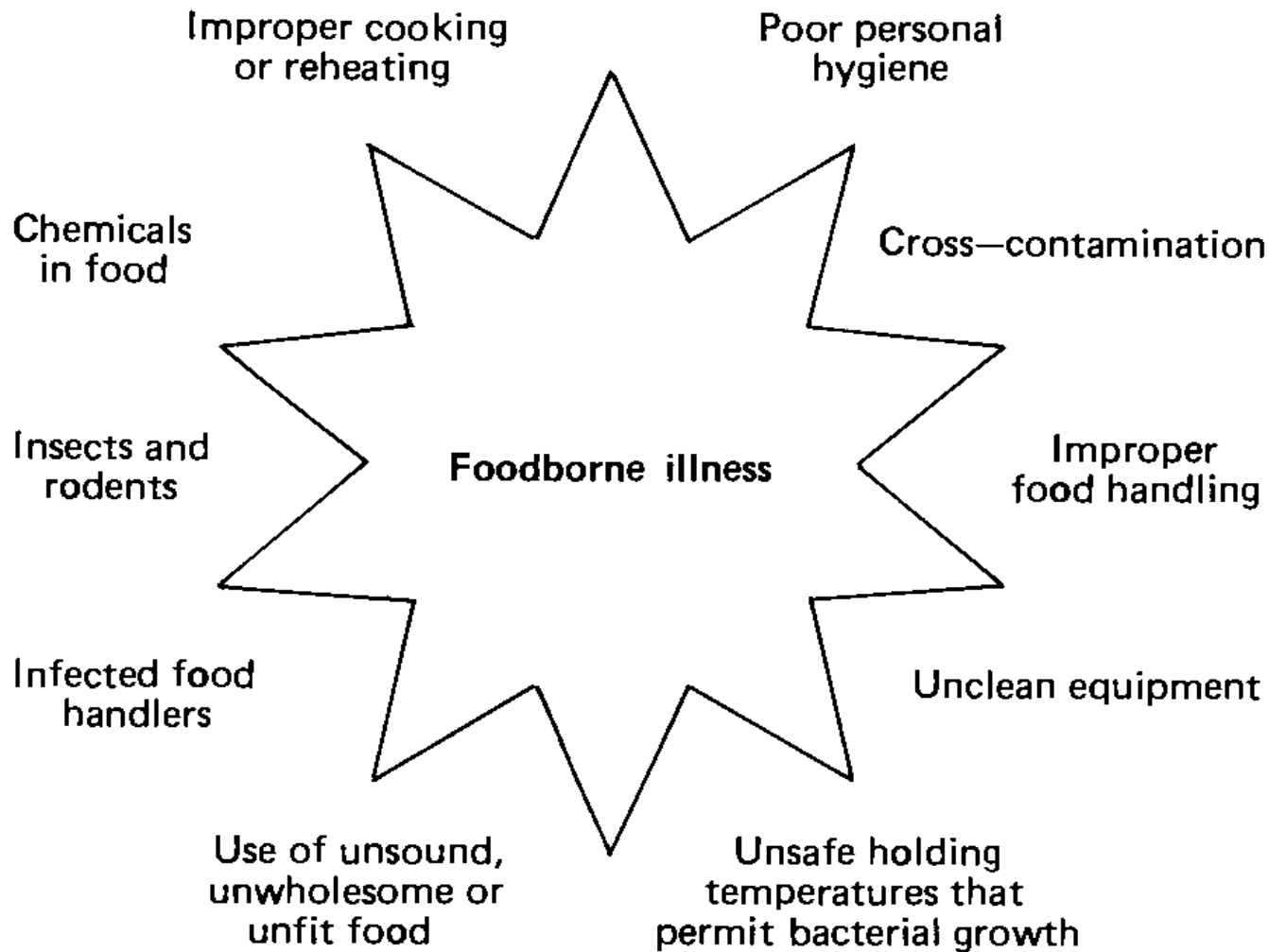
To assess whether foodhandlers' knowledge influenced their attitude and practice with regards to food safety

To determine compliance with food safety practices by both gender through observation

To determine the effect of other demographic characteristics on food safety knowledge

To make recommendations on how to improve food safety in franchise restaurants

LITERATURE REVIEW



RISK FACTORS

- **Food from Unsafe Sources**
- **Poor Personal Hygiene**
- **Inadequate Cooking**
- **Improper Holding/Time and Temperature**
- **Contaminated Equipment/Protection from Contamination**

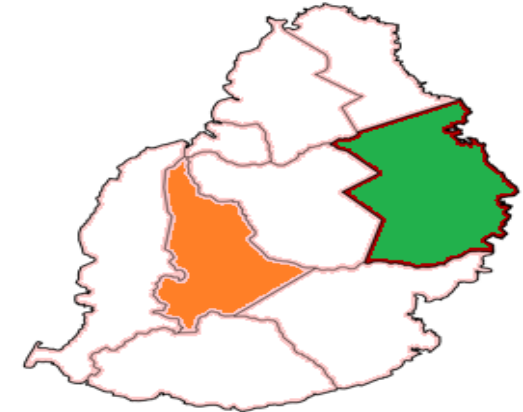
Source: FDA, 2009

Summary of factors that can contribute to foodborne illness

Source: (Michael, 1989)

METHODOLOGY

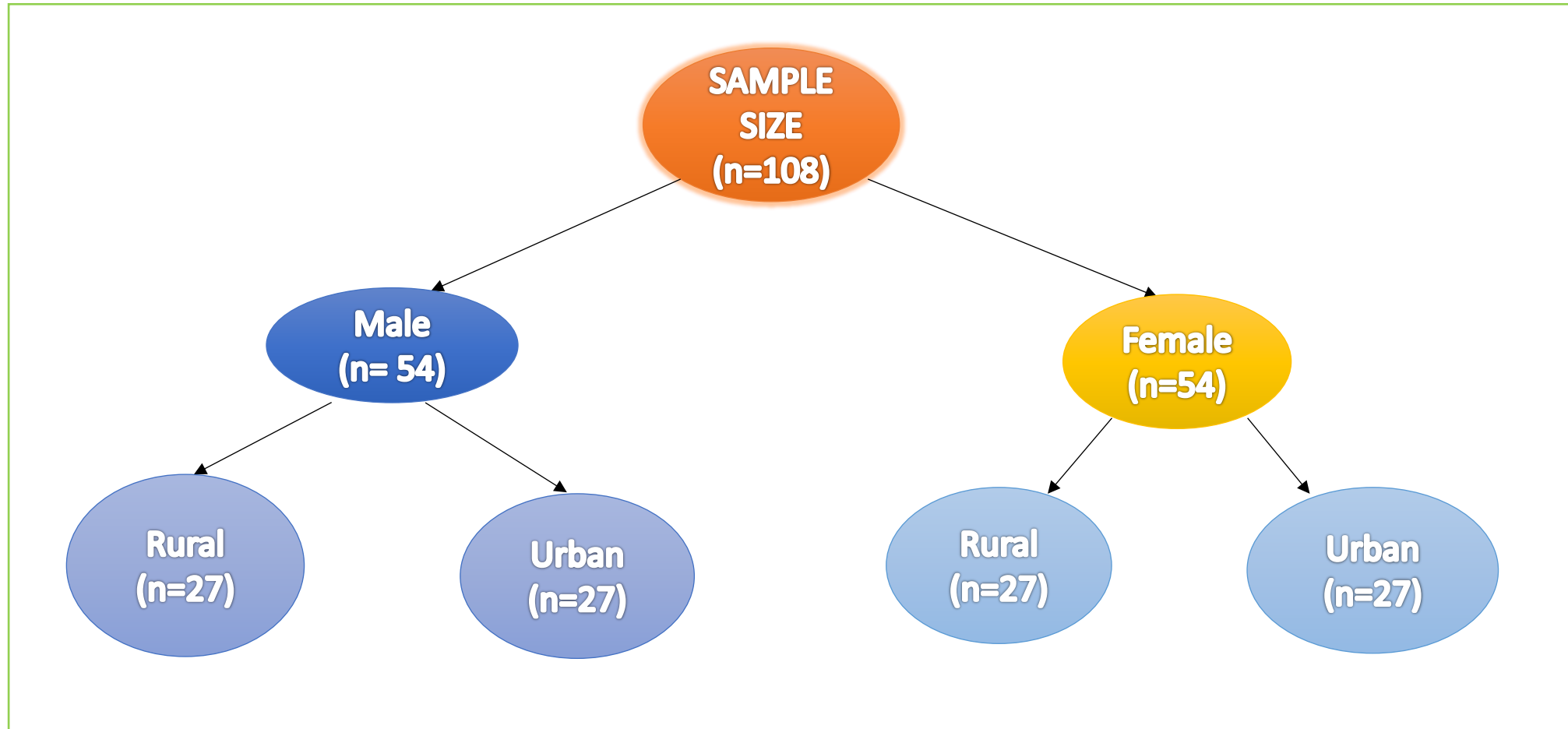
- The study was conducted in the district of:
 - Flacq to represent rural areas
 - Plaine Wilhems to represent urban areas



Source: <https://en.wikipedia.org/wiki/Mauritius>

- Included a **field survey** among 108 foodhandlers ⇒ structured questionnaires ⇒ Face to face interviews
- **Direct observation** of foodhandlers in 16 different franchisees ⇒ checklists
- Questionnaires/ checklists were pretested and then validated and revised.
- Implemented from beginning of October to mid December 2016

SAMPLING



QUESTIONNAIRE/ CHECKLIST STRUCTURE

- Written in bilingual language (English and creole)
- Designed based on and modified from previous studies :

Sookool, 2011; Sharif *et al.*, 2013; Panchal *et al.*, 2014; Sookaram, 2014; Fadaei; 2015; Al Shabib *et al.*, 2016, CAC, 1993; Food Regulations, 1999 and booklet of health Inspectors of the Ministry of Health and Quality of Life (Radhakeesoon, 2012)

QUESTIONNAIRE /CHECKLIST STRUCTURE CONTD

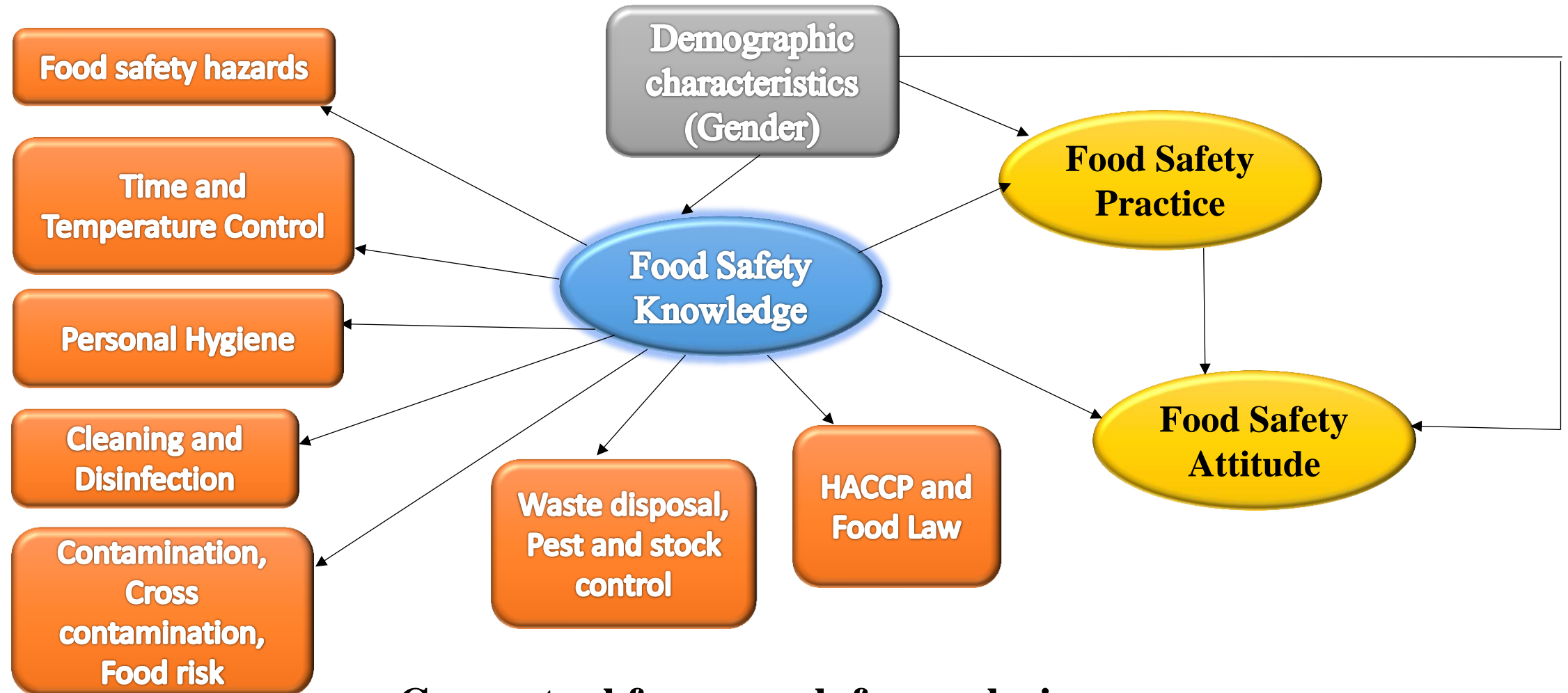
QUESTIONNAIRE (Divided into five sections)

Section A	<ul style="list-style-type: none">• Characteristics of respondent
Section B	<ul style="list-style-type: none">• Occupational information and lifestyle habits
Section C	<ul style="list-style-type: none">• Food safety Knowledge• 32 Questions on Food safety hazards, time and temperature control, personal hygiene, cleaning disinfection waste disposal, pest and stock control, HACCP and Food Laws Contamination and x-contamination
Section D	<ul style="list-style-type: none">• Food Safety attitude (19 Likert scale questions)
Section E	<ul style="list-style-type: none">• Food Safety Practice (20 Likert scale questions)

CHECKLIST

Checklist	<ul style="list-style-type: none">• Seven subsections on personal hygiene , food storage, contamination, temperature/ time control, cleaning and sanitation
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DATA ANALYSIS



Conceptual framework for analysis

TESTS AND LIMITATIONS

- Data analysis was carried out using the SPSS 16.0
- All tests performed at 5 % level of significance ($p < 0.05$)
- Pearson's Chi-square test
- ANOVA Tests

LIMITATIONS

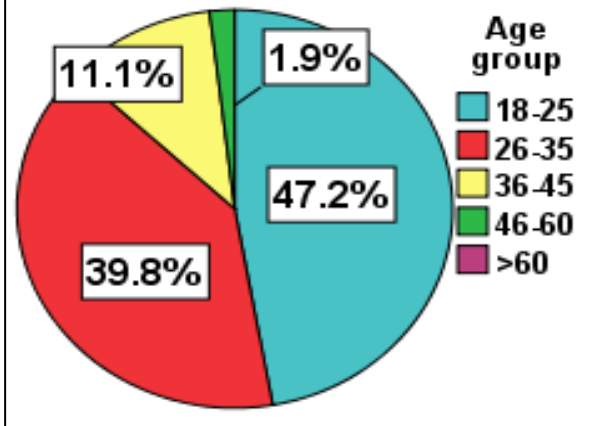
- Majority of the franchisees were female dominant.
- Restaurants work on a shift system.
- Some branch managers were reluctant for interviews at peak times.
- In some cases permission had to be sought from managing directors before proceeding



RESULTS AND DISCUSSION

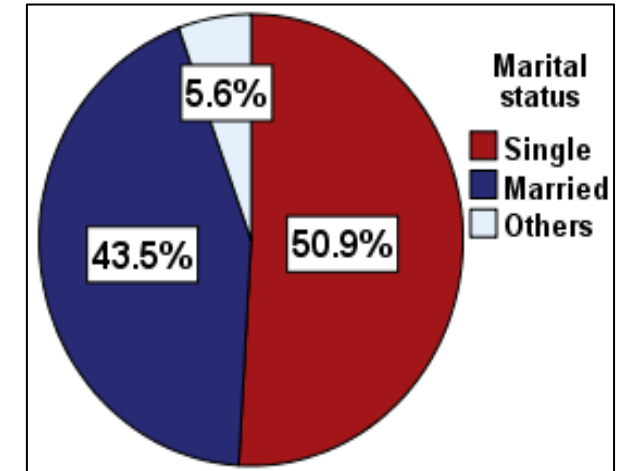
DEMOGRAPHIC CHARACTERISTICS

AGE GROUP



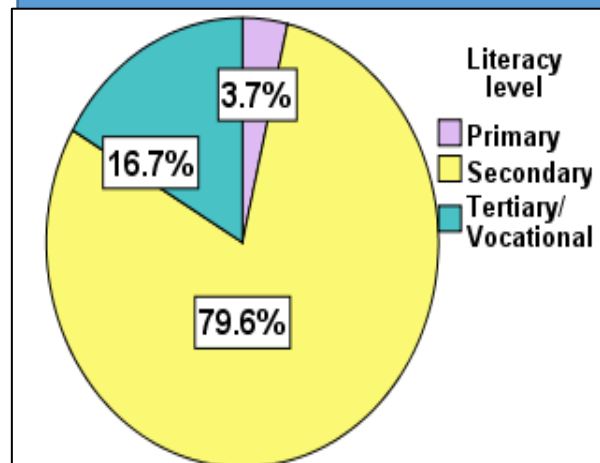
Most respondents of 18-25 years

MARITAL STATUS



50.9% were single

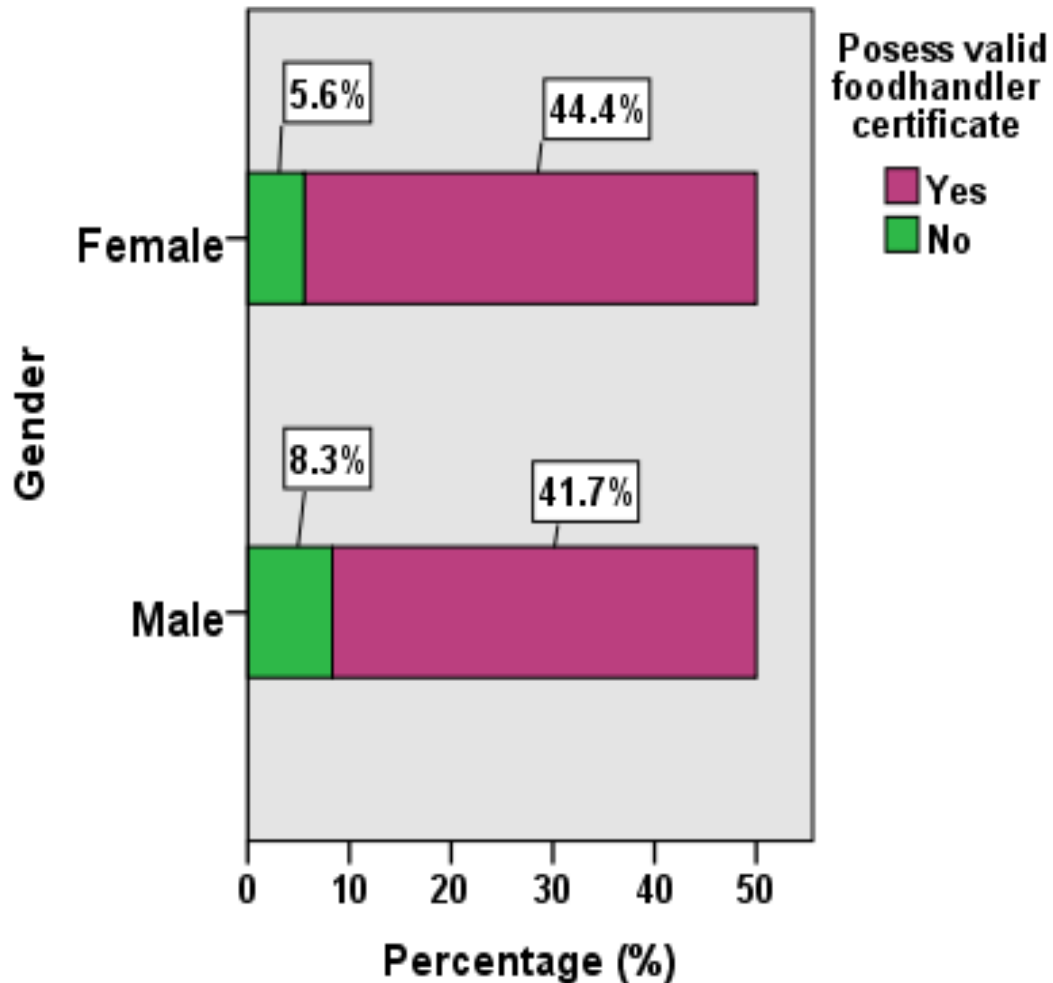
LEVEL OF EDUCATION



Majority were secondary school leavers

Higher than in studies conducted by Baluka *et al.*, (2014) in Uganda.

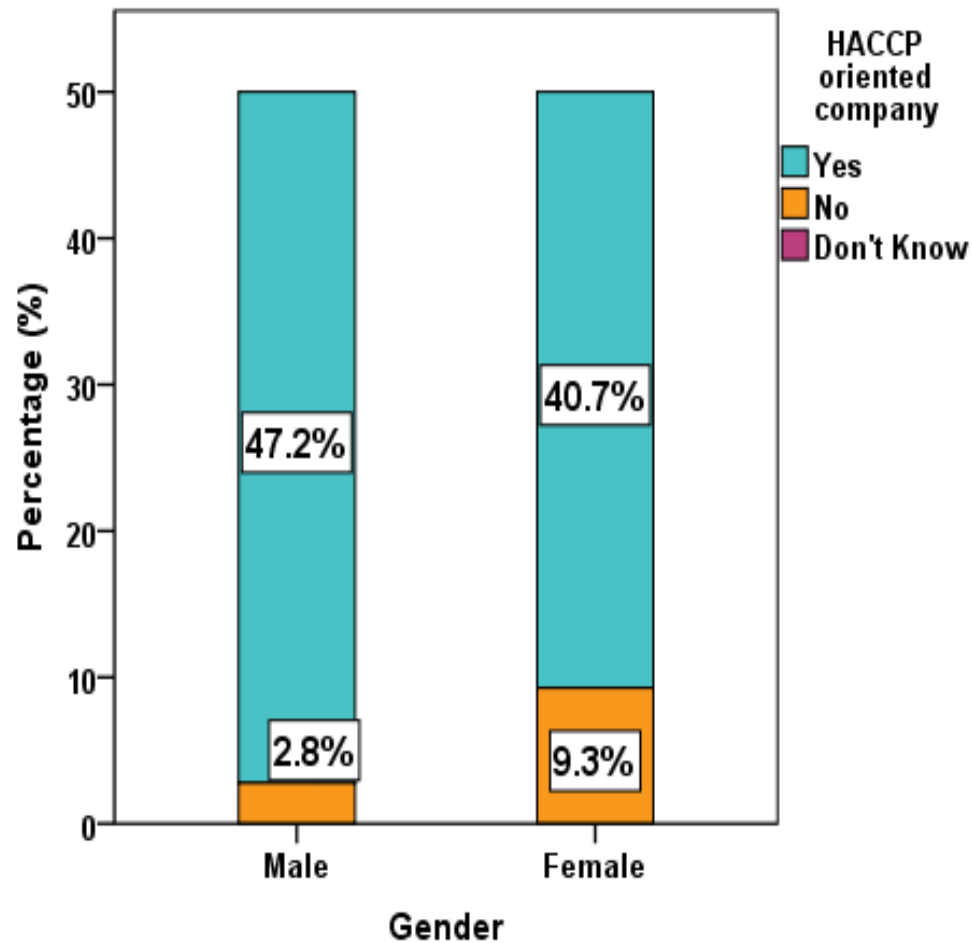
POSSESSION OF FOOD-HANDLERS CERTIFICATE



5.6% Female and 8.3% Male were not in possession of a valid Foodhandlers certificate

- Against the law
- Verified by
 - ✓ Public Health and Food Safety Inspector
 - ✓ By the management of the franchise
- Greater number of visits by public health officials, the fewer the likelihood of law violation (Harris *et al.*, 2014)
- There was an association ($p=0.02$) between FHC and knowledge
- Consistent with studies (Kibret and Abera, 2012; Onyeneho and Hedberg, 2013; Al Suwaidi *et al.*, 2015)

NUMBER OF FOOD HANDLERS WORKING HACCP CERTIFIED COMPANIES



- More males (47.2%) than females (40.7%) were working in HACCP oriented companies

- Might justify why male showed better knowledge on aspects like

- ✓ Food safety hazard (Male:37%, Female:29.6%)

- ✓ Cooking temperature (Male:29%, Female:22%)

- ✓ Handwashing (Male:48.1%, Female:47.2%)

- ✓ Cleaning and disinfection (M:41%, F:29%)

- ✓ Pest control and HACCP

- Sustained by study of Angelillo *et al.* (2001)

- Not all franchises surveyed were implementing HACCP

- HACCP is not compulsory in Food Regulations

RESPONSE ON THAWING AND REHEATING

Gender Response on temperature

	Male percentage(%)			Female percentage (%)		
	Correct	Incorrect	Don't Know	Correct	Incorrect	Don't Know
Reheating food above 63 ° C	28.7	21.3		33.2	26.8	
Method for thawing	14.8	32.4	2.8	10.2	36.1	3.7

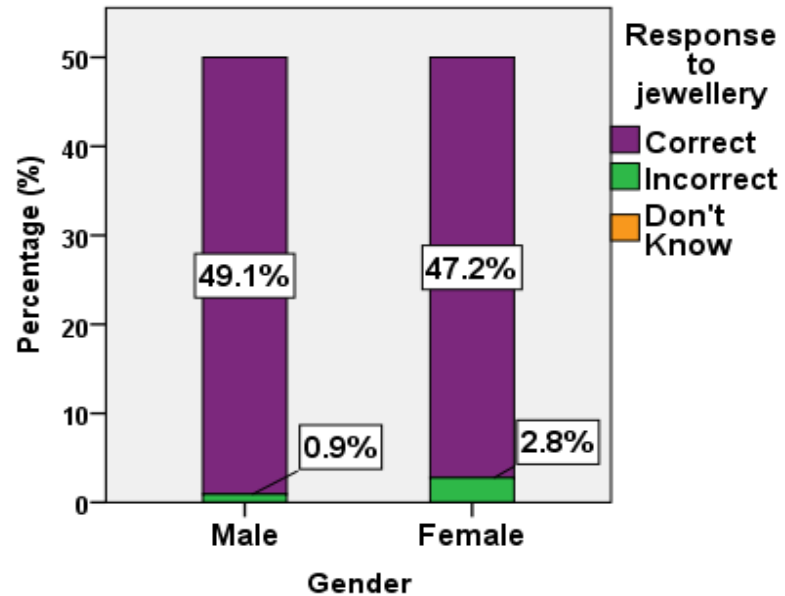
- High (%) of incorrect answers regarding **reheating**
 - Required for destruction of bacteria and toxins.
- **Thawing:** Similar findings by study of Debess *et al.*(2009) in Oregon and Sharif *et al.*(2013) in Jordan
 - Improper thawing can lead to microbial multiplication

GENDER RESPONSES ON OTHER ASPECTS (GAPS)

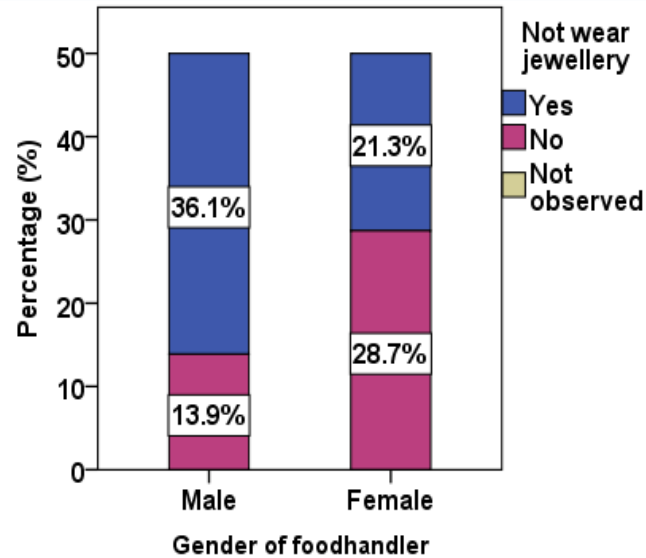
	Male percentage (%)			Female percentage (%)		
	Yes	No	Don't Know	Yes	No	Don't Know
Correct response on water activity factor	33.3	16.7		23.1	26.9	
Correct response on nutrient factor	19.4	30.6		18.5	31.5	
Correct Response on food laws	25.1	24.9	0.9	18.5	28.7	2.8
Wear clean light-coloured overall	11.1	38.9		14.9	35.2	
Manual Record keeping	20.4	29.6		13	37	

KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING JEWELRY

Knowledge on wearing of jewellery during food handling



Wearing of jewellery during real practice



- 13.9% Male and 28.7% Females wore jewellery while handling food
- Self-reported practice contradictory with knowledge, attitude and practice response
- In line with research by Kibret and Abera (2012)
- Represent a food safety hazard

Attitude and practice of Foodhandlers regarding jewellery

Attitude	Strongly disagree	Disagree	Strongly disagree	Disagree
Statement	MALE (%)		FEMALE (%)	
Jewellery can be worn while handling food	39.8	8.3	39.8	8.3
Reported Practice	Never	Often	Never	Often
I wear jewellery while handling food	45.4	4.6	48.2	1.8

Comparison between age, educational level, experience level and knowledge score (n=108)

FOODHANDLER	ONE WAY ANOVA	
	F-test	P-value
AGE	0.185	0.91
EDUCATIONAL LEVEL	5.464	0.01
EXPERIENCE LEVEL	0.909	0.48

- There was an association ($p=0.01$) between education level and knowledge score
⇒ In line with studies of Sharif et al., (2013), Olumakaiye and Bakare, (2013)
- There was no relationship ($p=0.48$) between age and knowledge score
- There was also no relationship ($p=0.48$) between experience level and knowledge score

GENDER KAP AND OBSERVATION SCORE

Mean Score	GENDER		Pearson Chi-square value	P-value
	Male (n=54)	Female (n=54)		
Knowledge	80.0 ±12.3	75.9±12.6	44.0	0.09
Attitude	90.4 ±8.4	90.4±5.2	29.8	0.97
Practice	94.8± 8.4	94.5±6.1	16.2	0.82
Observation	25.5 ±1.3	24.8±1.5	11.2	0.02

- Chi-square test reveal **no difference between:**
 - ✓ Mean knowledge score
 - ✓ Mean attitude score and
 - ✓ Mean practice score
- **Of both gender**
 - Very good knowledge, practice and attitude
 - Knowledge score: Lower than study of Rosnani *et al.*, 2014 but practice and attitude were in line
 - Mean observation score was different for both gender (**p=0.02**)

RELATIONSHIP BETWEEN KNOWLEDGE, ATTITUDE AND PRACTICE

Relationship	Correlation	P-value
Relationship between Knowledge and Attitude	0.33	0.00
Relationship between Knowledge and Practice	0.26	0.00
Relationship between Attitude and Practice	0.34	0.00

Knowledge and attitude

- Test revealed a significant weak positive ($p=0.00$) correlation between knowledge and attitude
- Similar to Al-shabib *et al.*, 2015 and Rosnani *et al.*, 2015
- Not in line with Abdul Mutalib *et al.*, 2012 and Fadaei, 2015

Knowledge and practice and attitude and practice

- Weak positive significant correlation
- Similar findings Rosnani *et al.*, 2014
- Comparable to a study of Iwu *et al.*, 2017

CONCLUSION

- Overall both gender had very good knowledge, attitude and practice
- There was no significant difference in mean KAP score of male and female foodhandlers
- But a **difference** in observation score between both gender
- More male were working in HACCP oriented companies
- Male had better notion on some aspects of food safety (food safety hazards, cooking temp, HACCP, handwashing, cleaning and disinfection, cross contamination)
- **Gaps** - Thawing, reheating of food, nutrient and water activity factors, colour of overall, data recording and food laws.
- In real practice **42.6%** were wearing jewellery while handling food
- Foodhandlers training had an impact on knowledge
- There was an association between knowledge and attitude, knowledge and practice and finally practice and attitude



RECOMMENDATION

- Ongoing education programmes to foodhandlers
- Focus on lacking areas (to bridge the gap in food safety)
- New techniques like oral test
- Management motivation

FUTURE WORK

The survey was carried out in the district of Flacq and Plaine Wilhems. It could be carried out in districts all over the island in greater number of franchisees to obtain a better demographic distribution.

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