

## Animal Source Food Consumption among Sri Lankans: A 24-Hour Recall Study in Galle and Matara District

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### Abstract

The types and levels of animal source food (ASF) consumption have direct influence on human health and wellbeing. A 24-hour dietary recall study was conducted among 165, randomly selected respondents living in Galle and Matara districts to understand their ASF consumption. ASF items consumed were categorized into three groups; 1) chicken and other meats, 2) fish and eggs and 3) dairy products. Ninety two percent respondents had consumed at least one ASF item within the last 24-hour recall period. 32, 21, and 10 percent respondents consumed 2, 3 and 4 ASF items respectively, during the 24 hour recall period. The most consumed ASF group was fish (78.3%). Forty two percent respondents had consumed fish at least once during the recall period. A person consumes 1.70 eggs per week. Meat were the third popular ASF (17.9%), closely followed by dairy (16.5%). Forty-three, 78 and 49 percent respondents enriched their breakfast, lunch and dinner, respectively with an ASF item. Apart from chicken, other meat types were not widely consumed. Mostly consumed dairy item was yoghurt followed by ice cream and curd. Only 2.5 percent respondents had consumed liquid milk. The mean ASF items consumed per day was 1.8 which comprised on 0.24 meat items, 1.36 fish items and 0.20 dairy items. Gender, age, income level and education level had no significant effect on the number of dairy, fish, meat and total number of ASF items consumed. By selecting fish as the main ASF item with some eggs, dairy and, meat in less frequently, respondents had made a wise choice related to ASF consumption.

**Keywords:** Animal-source-food, Consumption, Dietary recall

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### Introduction

It is widely accepted that the consumption of ASF improves human nutrition and health, by preventing protein and micronutrient deficiency related problems such as low birth weights, impaired cognitive and motor development and anemia (Smith *et al.*, 2012). Low ASF consumption has been identified as one of the major reasons for widespread protein and micronutrient deficiencies in many developing countries including Sri Lanka. For example, Per capita availability of major ASF items such as meat (21.4g), eggs (11g), fish (42g) and dairy products (33g) of Sri Lanka was low (Food Balance Sheet, 2012) and, thus it is required to be increased. However, mere increase in ASF consumption would be counterproductive with respect to human health and wellbeing since the excess consumption of some items, particularly red meat found to be associated with some health risk (Larsson and Orsini, 2013). Furthermore, consumption of some ASF items such as fish and dairy has been reported to have additional health benefits.

The types and levels of ASF consumed by an individual as well as a community depend on a range of social, economic, cultural and individual factors. Particularly, it has been shown that ASF consumption increases sharply with the

increasing per capita income and urbanization. Furthermore, people tend to consume more processed ASF items with increasing wealth and urbanizations. However, influences of above major drives are again controlled by many other cultural and social factors. Sri Lanka experienced a rapid income growth and urbanization during recent years. ASF item consumption, among Sri Lankans has not been well studied. The level of consumption is commonly given as food availability values which do not reflect the real household level consumption. Objective of the present study is to understand the ASF item consumption in Galle and Matara District, Sri Lanka, using 24 hour dietary recall method.

### Materials and Methods

A 24 hours dietary recall study was conducted with 165 of randomly selected respondent living in Galle and Matara District Sri Lanka. The sample comprised of fairly educated, middle income earning middle aged cohort of respondents (Table 2). Each respondent was asked to record the food items consumed for breakfast, lunch and dinner and as desserts during the last 24 hours. Subsequently, ASF items consumed was categorized into groups; namely chicken and other meats, fish and eggs and dairy products. Additional information such as age, gender, education level and income level

were also recorded. Percentage of respondents who consumed each ASF item for breakfast, lunch and dinner and as a dessert was determined. Kruskal-wallis analysis was performed to determine effects of gender, age, income level and education level on the number of dairy, fish, meat and total number of ASF items consumed.

### Results and Discussion

Ninety two percent respondents had consumed at least one ASF item within the 24 hour recall period (Table 1). Though 32, 21 and 10 percent respondents had consumed 2, 3 and 4 ASF items respectively; during the 24 hour recall period attention should be given to the fact that 8 percent respondents do not consume any ASF item. The latter group of respondents may represent those who do not consume ASF items at all and those who have not consumed during the last 24 hours. Having been consumed whatever fish product by 78.3 percent of respondents, the most consumed ASF group was found to be fish. Forty two percent respondents had consumed fish, at least once during the recall period. Department of Census Statistics, Sri Lanka National Food Balance sheet 2012) has also reported that fish is the most widely consumed ASF item. Since, fish is considered a highly nutritious ASF and presents lesser health hazards, many respondents seem to have done a nutritionally wise choice by selecting fish as their main ASF. Assuming that when consume, each individual consumed a whole egg, it was calculated that a person consumes 1.70 eggs per week. Weekly egg consumption level reported herein is lower than the National per capita egg availability value (1.96 eggs/week) (Department of Census and Statistics, 2012), probably due to the counting of eggs for other uses as well. Compared to fish and chicken, eggs are relative lower in price, higher in availability and are well accepted across all ethno-religious segments of Sri Lanka. It has been shown that a healthy adult can consume even up to seven eggs per week, without adverse health effects. Therefore, results of this study show that there is a potential to further increase the egg consumption. It was calculated that respondents consumes fish, dry fish, chicken and whatever ASF 3, 1.8, 1.1 and 6.4 times a week.

Meat types were the third popular ASF item (17.9%) closely followed by dairy (16.5%). The national per capita meat availability is dominated by chicken meat (7.09 kg/year) followed by beef (1.80 kg/year) with a marginal contribution from mutton (0.11 kg/year) and

pork (0.32 kg/year) (Department of Animal Production and Health, 2013).

The lower consumption of other meat types found in this study may be due to the predominantly Sinhala-Buddhist sample. Being a white meat, chicken meat presents less health risks compared to other meat types. Therefore, consumption of more chicken compared to other meat is also a wise choice. Furthermore, no respondent reported to consume processed meats such as sausages, meat balls, ham and bacon. Having selected fish as the primary ASF item with some eggs, dairy and lesser amount of other meat types, respondents seems to have made a conscious choice in their ASF consumption.

Item-wise and meal wise ASF consumption information about Sri Lankans are lacking. Fish consumption levels reported in this study is comparable to that reported by Rathnayake *et al.* (2012) for a cohort of elderly Sri Lankans. However, the latter study has reported lower egg (5%) and meat (4%) consumption levels compared to the respective values in this study. The present study found that though expensive, dry fish is equally popular as eggs and second only to fish. High dry fish consumption among Sri Lankans may need scientific attention in the light of strong association between salty food intake and *Helicobacter pylori* infection and gastric cancers, reported by Tsugane, (2005). Canned fish, prawn and cuttle fish were not widely consumed fish food items. The mean time of breakfast, lunch and dinner were 8.00a.m, 12.50p.m and 7.40p.m. Probably due to the simple breakfast tradition, only 43% of respondents had enriched their breakfast with an ASF item, Lunch is the main meal in Sri Lankan. Consequently, the percentage of respondents who consumed a lunch containing an ASF item was as high as 78 percent. Though dinner is also getting simpler in Sri Lanka, it is a positive sign that almost half of the respondents consumed a dinner with ASF item.

Sprat was the most consumed ASF item for breakfast and that of lunch and dinner was fish. Egg was more or less equally consumed in all three meals. Apart from chicken, other meat types were not widely consumed.

Dairy items were consumed mainly as a dessert. Around 16 percent respondents had consumed at least one dairy food item per day. Rathnayake *et al.* (2012) have reported 59 percent dairy product consumption among an elderly Sri

Lankan community. However, it must be noted that the consumption of milk powder was not

considered in the present study. The most consumed dairy item was yoghurt followed by

**Table 1:** Animal source food consumption of the respondents

ASF item	% of Respondents				Consumption	
	Breakfast	Lunch	Dinner	Category	% per day	Time per week*
Chicken	2.5	11.8	7.4	17.9	16.1	1.1
Other meat	0.0	0.6	1.9		2.5	0.17
Egg	7.5	10.5	9.9	24.2	24.2	1.70
Dry Fish	8.7	16.1	10.6	78.3	25.4	1.8
Fish	10.5	34.1	14.9		42.2	2.9
Sprat	11.2	9.9	7.4		22.3	1.5
Cuttle fish	0.0	2.5	1.9		3.7	0.16
Prawn	1.2	1.2	1.9		3.0	0.2
Canned fish	2.5	0.0	1.2		3.7	0.26
Total (All Fish Types+Egg+Meat)	43.4	78.2	49.6			87.6
<b>Dairy products**</b>						
Liquid milk	2.5					0.17
Yoghurt	6.9					0.5
Ice cream	5.6					0.4
Cheese	1.2					0.08
Curd	3.7					0.26
Total (Dairy)	16.5					1.1
<b>Total ASF consumption**</b>						
No ASF	8.0					
1 item	25.5					
2 item	32.3					
3 item	21.7					
4 item	10.5					
5 items	0.6					
6 item	1.2					
Total ASF (All Fish Types +Egg +Meat +Dairy)92						6.4

\* Percentage of respondents per day/100 \* 7

\*\*Whole day (without considering for breakfast, lunch or dinner)

**Table 2:** Effect of demographic variables on the consumption of different ASF items as determined by 24-hour recall study

Variable		%	Consumption (Median)			
			Dairy	Fish	Meat	Total ASF
Gender	Male	53	0	0	0	2
	Female	47	0	0	0	2
Age (Years)	<18	4	0	0.5	0	2
	18-30	59	0	1	0	2
	31-43	11	0	0	0	2
	44-56	20	0	0	0	2
	57-69	6	0	0	0	1.5
Education (%)	Primary only	0.78	0	1	0	2
	Up to O/L	15	0	0	0	2
	Up to A/L	39	0	1	0	2
	Diploma	5.5	0	1	0	2
	Degree or above	39	0	1	0	2
Income (Rs/Month)	No (students)	27	0	1	0	2
	>10000	8	0	0	0	1
	10000-29000	27	0	1	0	2
	30000-49000	30	0	1	0	2
	49 000<	8	0	1	0	1

ice cream and curd. Despite the liquid milk promoting campaigns, undertaken during recent past, only 2.5 percent respondents had consumed liquid milk.

The mean ASF items consumed per day was 1.8 which comprised on 0.24 meat items, 1.36 fish items and 0.20 dairy items. Kruskal-Wallis analysis showed that gender, age, income level and education level had no significant ( $p>0.05$ ) effect on the number of dairy, fish, meat and total number of ASF items consumed (Table 2).

### Conclusions

The most widely consumed ASF items are fish, dry fish, dairy products, eggs and chicken. By selecting fish as the main ASF item with some eggs and dairy and, meat in less frequently, respondents were found to make a wise choice with regard to ASF consumption. The present 24-hour recall study found no significant effect of age, gender, income or educational level on the ASF consumption.

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