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Nutrition Knowledge and Misconception about Animal Source Food among Sri Lankans

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ABSTRACT

Purpose : *Though essential for optimum nutrition and health, excessive consumption of animal source food items (ASF), particularly certain types is associated with health risks. Nutritional knowledge and misconceptions about ASF are among the factors that affect the type and level of consumption. This study investigates the nutrition knowledge and misconceptions about the ASF among different demographic segments of Sri Lanka.*

Research Method : *The sample comprised of 361 randomly selected respondents. Each respondent was asked to indicate whether they agreed or disagreed on 20 knowledge-testing statements and to the extent they were certain about the each of the answers- in a four point Likert scale ranging from completely uncertain to completely certain.*

Findings : *Nutritional knowledge score was as low as 34%. Gender and age had no significant effect on knowledge score. Tamils, Hindus, rural dwellers and respondents of lower education levels reported lower knowledge scores. Almost one in four believed that brown eggs are more nutritious than white. Around 16% respondents believed that even for a healthy adult an egg a day is unsafe. Older and rural respondents opined brown eggs were more nutritious while relatively younger urban segment was more concern about egg consumption level. As high as 19% of the respondents failed to recognize the nutritional superiority of fresh milk over powdered milk.*

Limitations : *Though the sample comprised all main ethnic, religious and dwelling categories, it was drawn only from two administrative districts.*

Originality/Value : *The study revealed that Sri Lankans still have low nutrition knowledge and hold a number of misconceptions about the ASF and, identifies the awareness programs particularly targeting rural and less educated social segments*

Keywords: *Animal, Food, Knowledge, Nutrition, Source*

INTRODUCTION

Many studies (Neumann *et al.,* 2002; Murphy and Lindsay, 2003; Randolph *et al.,* 2007; Smith *et al.,* 2012) have emphasized 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 anaemea. However, ASF intake has been reported to be low in many developing countries including Sri Lanka. Per capita availability levels of major ASF items such as meat (22.2g), egg (12g), fish (44g) and dairy products (40g) in Sri Lanka (Food Balance Sheet, 2014)are lower than the recommended intake levels suggested by Food Based Dietary Guidelines (2011) for Sri Lankans. It is a popular notion that better nutrition knowledge is a prerequisite for the acceptance of ASF as a food item and is important to regulate the type

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and level of consumption. Meanwhile, the type and level of ASF consumption are associated with some health risks (Larsson and Orsini, 2013). Despite this common understanding, it is not clear whether better nutritional knowledge always promotes a healthy diet or not.

Some studies (Axelson*et al.,* 1985; Paterson *et al.,* 1996;Dallongeville *et al.,*2000;Worsley, 2002) have suggested that nutritional educational progame cannot make a positive impact on dietary behavior thus is a waste of resources. On the hand, Wardle *et al.,* (2000) has concluded that nutritional knowledge explained between 4% and 22% of variation in food intake and a better knowledge made consumption pattern healthier. Harnack *et al.,* (1997) reported that nutrient intakes were closer to recommendations among the respondents having better nutritional knowledge. Dietary knowledge is reported to reduce the beef and pork consumption (Yen *et al.,* 2008) but increased the fish consumption (Kaabia *et al.,* 2001). Spronk *et al.,* (2014) reviewed the relationship between nutritional knowledge and concluded that there was a significant, positive, but weak ($r< 0{\cdot}5$) associations between higher nutrition knowledge and dietary intake.

Relationship between nutritional knowledge about ASFs and macro-level ASF consumption pattern is not well understood. A study by Kinnucan *et al.,* (1997) reported that health information about the cholesterol has been the major reason for increased poultry meat production in USA in the expense of beef and the magnitude of the effect of health information was higher than that of price. Brown and Schrader, (1989) showed that information on the links between cholesterol and heart disease had decreased per capita shell egg consumption in USA by 16% to 25% during 1955 to 1987. Furthermore, the study revealed that in response to price reduction, egg consumption increased at a lesser rate than it would have been the case without the information about cholesterol risks. Misconceptions, believes, myths related to ASF may also influence the type and level of consumption. Gittelsohn and Vastine, (2003) stated that the answer for the question as to why do some households of similar economic circumstances experience deficiency and others do not related to household level believe are attitudes. Impacts of such beliefs, myths, misconceptions on the nation-wide nutritional status are assumed to be high under diverse multi-cultural social conditions. Objective of the present study is to ascertain the level of nutritional knowledge and misconceptions about the ASF among Sri Lankans as affected by demographic variables.

MATERIALS AND METHODS

Data were collected from three hundred and sixty one respondents representing all three ethnic communities, four religions, both genders, three types of dwellings (rural, urban and estate), a range of educational and age groups. Urban dwellers were randomly selected from Municipal Council areas of Matara and Galle. Rural respondents were selected from the list of families available with seven Village Officers. Estate living respondents were randomly selected from three tea estates in Galle District, Sri Lanka.

Demographic variables, nutrition knowledge about ASFs and the acceptance of a range of ASFs were inquired using a structured-type pre-tested questionnaire. Method used by Hsu *et al.,* (2008) was used to determine the level of nutrition knowledge. Twenty statements were prepared to test nutritional knowledge and common misconceptions about commonly consumed ASF items in Sri Lanka (Table 01). The questionnaire included only declarative type statements (Anderson 1995) that covered all four aspects of the nutrition-knowledge testing protocol suggested by Parmenter *et al.,* (2000). The questionnaire contained a few statements containing technical terms.

Table 01: Statements used and the scoring system used to determine the knowledge about ASF

Statement No	Statement
1	Crabs and prawn contain high amount of cholesterol
2	Egg white contains more vitamins and minerals then yolk
3	Vegetables are low in amino acid lysine
4	Pork is considered a red meat
5	Red meat is rich in iron
6	Brown eggs are more nutritious than white
7	Chicken meat contain more protein than fish
8	ASFs are important for us mainly as a protein source
9	Proteins of ASF are more digestible than that of vegetable
10	Fresh milk is nutritionally better than powdered milk
11	Backyard chicken eggs are more nutritious than farmed eggs
12	Sprat is a good source of calcium
13	Fish is a better ASF than meat
14	Risk of getting cardio vascular diseases is higher with the consumption of beef than chicken
15	Beef and mutton are considered as red meat
16	Fish provides some beneficial fatty acids
17	Sausages and meat balls are more nutritious than unprocessed meat
18	It is safe for a healthy adult to consume an egg a day
19	Milk is a rich source of iron
20	Small fish are more nutritious than large fish

Scoring system

Statement no	Response	Completely Certain	Certain	Uncertain	Completely Uncertain
1	Correct	+1	+0.66	0.33	0
	Wrong	-1	-0.66	-0.33	0

Each respondent was asked to indicate whether he or she agrees with a particular statement. Then the respondent was asked to indicate the extent to which he or she is certain about the answer. Depending on the answer and the level of certainty, a scoring system was used to scale the knowledge (Last rows Table 01).

Statistical analysis

Each respondents' scores for all 20 statements were added to determine the total score. The maximum possible score was 20. Then the total score was expressed as a percentage. One sample t test was used to compare the percentage total score with the values reported in literature. The total knowledge score was subjected to GLM procedure to determine the effects of demographic variables. Significant effects were compared using Turkey test. Multivariate analysis was used to determine the level of variance explained by the significant variables. Kruskal Wollisnon parametric test was performed to determine the effects of demographic variable on the responses for each knowledge testing statement.

RESULTS AND DISCUSSION

Studies which specifically evaluated the nutritional knowledge about ASF are scanty. Consequently, results of this study had to be compared with those studied the general nutrition knowledge. The methodology used

in the present study allowed us to identify misconceptions and myths which respondents held (wrong answer with complete certainty; -1) while avoiding "chance" scoring. Analysis of the responses using above methodology showed that the nutrition knowledge about the ASF was low. The total knowledge score ranged from 5 to 17.6 with a mean of 6.8 out of 20 (34.3%) and 3.7 of SD (Table 02). Even among the respondents whose median scale was 1, the total mean knowledge score was 60.9%. The mean knowledge score was significantly lower than the value reported for a South Australian (65.2%) (Hendrie *et al.,* 2008) and a UK community (67%) (Parmenter*et al.,* 2000). Knowledge score of the respondents having tertiary level of education (45.6) was lower than the general Nutrition knowledge of dietetics (89.8%) and, even computer science (54.6%) undergraduates in the UK (Parmenter and Wardle, 1999) and University students in Qwait (56.9) (Al-Isa Alfaddagh, 2014). Since there is a possibility that knowledge score would have been higher had we used the methodologies reported in literature, the responses were re-analyzed giving score +1 for write answers, 0 for no idea and -1 for wrong answers, without considering the level of certainty about the responses. Even such a less conservative analysis resulted in a knowledge score; 67.4%. Even this value is far below the knowledge levels reported in studies that have adopted similar scoring schemes (Parmenter and Wardle, 1999; Al-Isa Alfaddagh 2014). Though some demographic segments needed particular attention as discussed below, the lower knowledge score clearly indicated the need of nutritional educational programs.

Knowledge score about ASF as affected by demographic variables

Demographic variables of the sample in comparison with national figures are given in Table 02. The following discussion is based on the analysis of responses considering the certainty level as well. Gender had no significant effect on knowledge score. In contrast, many studies (Parmenter*et al.,* 2000; Crawford and Baghurst 1990; Tate and Cade, 1990; Hansbro, 1997) reported higher nutrition knowledge for women. Chi square analysis showed that the level of education was not affected by the gender but by the dwelling. The education level was low among Estate dwelling respondents. Reflecting the importance of education, higher the formal educational level better the nutrition knowledge about ASF. Positive impacts of educational level on nutritional knowledge are well established (Hansbro, 1997; Levy *et al.,* 1993). Three distinct knowledge level categories each significantly different from others could be identified according to the respondents' formal education level; 1). Those having less than (14.0) and up to primary (20.4), 2). Having up to O/L (30.9) and A/L (35.6) and 3). graduate (45.6). It should be noted that those A/L qualified respondents and graduates were heterogeneous in their majoring areas of studies. On one hand, above observation suggests that making people engaged in formal education alone could improve the nutrition knowledge probably due to the higher literacy rate, exposure to more information and rational thinking about the commonly held nutritional misconceptions and myths. On the other hand, low knowledge score even among educated people suggests that there is room for further improvements through nutrition awareness programs.

Several authors (Permenteretal., 2000; Levy *et al.,* 1993 and Hansbro1997) have shown that middle age people, and married peoples had better knowledge. The present study found no significant effect on knowledge score due to age or civil status. Multivariate analysis showed that 30.6% of the variance in knowledge score was explained by race, dwelling, religion and education. The knowledge score of the Tamil respondents was significantly lower than that of Sinhalese and Muslims. Lower score of the Tamil respondents may have been mainly due to the low knowledge score of the Estate dwelling respondents who are completely Tamils. In line with this observation, Hindus had a significantly lower knowledge score than other religiosities. The chi square analysis showed significantly poorer educational level among Tamil respondents and this explains

the lower knowledge score of them. Protein and micronutrient deficiencies particularly that of iron, Zn and iodine can be overcome by increasing the ASF consumption (Murphy and Allen, 2003). Prevalence of child and maternal malnutrition is higher in estate sector and rural areas compared to country average (Jayawardena, 2014). Among other socio-economic factors, poor knowledge about the ASFs may also be a critical factor that lowers ASF consumption among those communities. Therefore, results of the present study clearly demonstrate the urgent need of nutritional awareness programs particularly targeting Estate and rural communities. Analysis of the responses for individual knowledge testing statement showed that apart from poor knowledge about ASF, there existed some serious misconceptions which required particular attention.

Table 02: Knowledge about animal source foods as affected by the demographic variables

Knowledge score	Out of 20	Median	% score	Range (% score)	
	6.8±3.7	6.6	34.3±18.7	-25-88.3	
Effects of demographic variables					
Parameter	Sample N	Sample %	National figure*	Percentage knowledge score	P
Ethnicity					
Sinhala	236	65.3	74.9	39.0±1.1[a]	0.000
Muslim	41	11.3	9.7	34.0±2.7[a]	
Tamil	84	23.2	15.0	21.3±1.8[b]	
Religion					
Budhist	209	57.8	70.2	38.9±1.1[a]	0.000
Christians	31	8.6	7.4	39.0±3.1[a]	
Hindus	80	22.2	12.6	20.7±1.9[b]	
Islam	41	11.4	9.7	34.0±2.6[a]	
Dwelling					
Rural	211	58	72.2	34.5±1.1[b]	0.00
Urban	100	27	21.5	44.2±1.6[a]	
Estate	50	13	6.3	14.0 ±2.3[c]	
Gender					
Male	198	55	47.2	34.4±1.3	0.85
Female	162	46	52.8	34.0±1.4	
Age					
20yr>	12	3.3	15-59	33.4±5.4	0.65
21-39	172	47.9		35.1±1.4	
40-59	109	30.3	61	35.0±1.8	
60<	66	18.4	13.3	31.4±2.3	
Education					
Less than primary	12	3.3	4.4	14.0±4.9[c]	0.000
Primary	40	11.2	24.4	20.4±2.7[c]	
Upto OL	63	17.6	43.2	30.9±2.1[b]	
Upto AL	174	48.6	16.3	35.6±1.3[b]	
Tertiary	69	19.3	12.0	45.6±2.0[a]	
Civil status					
Single	213	59.2		35.5±1.3	NS
Married	148	40.8		32.5±1.6	

http://www.cbsl.gov.lk/pics_n_docs/10_pub/_docs/statistics/other/Socio_Econ_Data_2014_e.pdf.

Misconceptions and perfect knowledge ASF

In order to make the interpretation simple, some response categories were combined and thereby identifying five knowledge level categories. Respondents having scale -1 were identified as those holding misconceptions while those having +1 were identified as having a perfect knowledge about the relevant statement. -0.33 and -0.66 collectively identified as having a wrong idea. +0.33 and +0.66 were regarded as having a right idea. Respondents who received scale 0 were considered to have no idea about the issue concerned. Percentages of respondents under each knowledge level category are given in Table 03.

Table 03: Respondents' knowledge about different knowledge testing statements as affected by demographic variables

Statement	Median	Percentage of respondents under knowledge level category					[1]Significance of Kruskal-Wollis test for ethnicity (H/h), Religion (R/r), Dwelling (D/r), gender (G/g) Age (A/a) and education (E/e)
		Misconception	wrong idea	No idea	right idea	Perfect knowledge	
1	0.00	13.8	26.8	9.7	35.6	13.8	H R, D, g, E
2	0.00	6.8	29.5	13.5	34.8	14.9	
3	0.00	1.3	12.7	45.7	37.3	2.7	H, R, D, a, E
4	0.33	1.3	17.6	24.6	47.6	8.5	H, R, D, E
5	0.33	2.2	9.3	17.1	60.8	10.2	H, R, D, E
6	0.33	22.9	16.5	5.8	33.2	21.2	H, R, D, A, E
7	0.33	5.5	22.6	11.9	50.3	9.4	D, a, E
8	0.66	3.6	3.3	4.4	43.7	44.8	h, R, D
9	0.66	10.8	10.5	9.1	41.5	19.9	h, R, D, E
10	0.66	18.5	6.0	2.2	31.8	41.2	H, R, D, E
11	0.66	8.3	1.3	3.6	40.4	46.5	r, D, A, E
12	0.66	4.4	16.8	7.4	44.5	26.5	H, R, D, g,
13	0.66	8.5	19.6	2.2	43.4	26.0	D, a, E
14	0.66	2.7	17.3	9.1	50.1	20.5	H, R, D, A,
15	0.66	0.2	4.6	17.4	58.3	19.1	H, R,D, g, E
16	0.66	1.3	11.3	8.5	46.2	32.4	H, R, D
17	0.66	11.6	9.3	2.2	44.5	32.1	H, R, D
18	0.66	15.7	23.8	2.7	23.5	34.0	H, R, D, A, E
19	0.66	9.4	17.1	8.8	47.2	17.0	H, R, D, G, A, E
20	1.00	9.4	17.1	8.8	47.2	17.0	H, R, D, A, E
Total score							
Mean	6.8	***	***	***	NS	NS	
% score	34.3±18.7						H, R, D, E
Range	-25 to 88.3						

1. H/h, Ethnicity; R/r religion; D/d Dwelling; G/g Gender; A/a Age; E/e Education

Upper case letters represent p<0.01 and lower case letters represent p<0.05 for the demographic variables denoted by respective letter

Median values and mean vales received for each statement ranged from 0 to +1 and 0.06 to 0.72, respectively. No statement received negative median values. Statements could be categorized into four knowledge level categories having median values of 0, 0.33, 0.66 and 1. However, statements within a given knowledge category were not related to each other. For example, the knowledge level category having 0 median values (no idea) consisted of three statements; one about the cholesterol content of crabs, one about the comparison of vitamin and mineral content of egg yolk and another one about the amino acid value of vegetables. The statement "vegetables are low in amino acid lysine" was included to test relatively a higher level of knowledge. As expected the above statement received a median of 0 (no idea). The percentage of respondents having "no idea" was also highest (45%) for this statement. Four statements recorded the median value of 0.33, i.e. respondents knew the correct answer but were not sure about it. For a set of 12 statements which covered a range of issues, respondents knew the correct answer but with some reservation. Interestingly, the statement "small fish are more nutritious than larger fish" received a median value of 1 and the highest mean score (0.72) and was the one having highest % of perfect knowledge. This can be regarded as a positive sign since the fish is the highest consumed ASF (42g/head/day) (Department of Census and Statistics, 2012) and small fish are cheaper than larger fish. Except gender all other demographic variables influenced the median score of this statement. The percentage of respondents who had perfect knowledge on this statement was high among Sinhalese (75%), Buddhists (75%), among 20-39 age category (38%), rural dwellings (51%) and A/L qualified respondents (44%).

Nutritional knowledge induced diet related behavioral or procedural responses (Anderson, 1995) of an individual could be stronger when he or she holds perfect knowledge (+1) or misconception (-1) than he or she has just an idea, whether right (+0.66 and +0.33) or wrong (-0.66 and -0.33). For all the statements, the percentage of respondents having perfect knowledge was higher than that of having misconceptions. For the Statements which received the highest percentage of +1 (perfect knowledge) responses were "backyard eggs are more nutritious than farmed eggs" (46%), "animal source foods are important as protein sources" (45%) and "fresh milk is more nutritious than powdered milk" (41%). However, it must be highlighted that even for above aspects more than 50% are yet to achieve a perfect knowledge level. Moreover, a substantial proportion of respondents reported -1 response that represented a misconception regarding the aspect concerned in the statement.

Under a multi-cultural society like Sri Lanka, egg can be regarded as the socio-economically most acceptable ASF since it is low in price compared to other ASFs and is widely accepted across all ethnic and religious communities. However, two grave misconceptions about the eggs were detected. Almost one in four believed that brown eggs were more nutritious than white and thus was identified as the most prevalent misconception. All demographic variables but gender had a significant effect on this misconception. Of the respondents having this misconception 68% were Sinhalese, 68% were Buddhists, 60% were rural dwellers, 36% were aged between 40-59 and 32% had up to A/L education. Since brown eggs cost 2-3 rupees more than a white one and require more feed per kg of egg, this misconception has not only negative nutritional but also financial and environment implications as well.

Meanwhile, around 16% respondents were not aware of the fact that a healthy adult can consume an egg a day without adverse health impacts. As high as 96% of the respondents consume eggs. Results of the present experiment suggest that in addition to other factors, misconception about the maximum safe consumption level of eggs may also be a contributory factor for as low as 1.96 eggs/week of lower per capita consumption (Department of Census and Statistics, 2012). Possible negative consequences of such a misconception should be considered in the light of the findings of Brown

and Scharader (1988) that cholesterol scare has not increased the per capita egg consumption in USA from 1955-1987 to match the increase in income and real egg price reduction. Apart from gender other demographic variables had effects on the knowledge about the maximum safe consumption level of eggs. Among those who held misconception, 65% were Sinhalese, 54% were Buddhists, 65% urban dwellers, 45% were 21-39 yrs old, and 47% were with the A/L qualification. The misconception about the colour of the egg was more among relatively older and rural respondents whereas the misconception about the maximum inclusion level was high among relatively younger urban segment. It seems that the latter misconception prevails more among higher socio-economic segments than lower.

Only 5.7% respondents do not accept fresh milk whereas 12% respondents do not accept milk powder. However, surprisingly, 18.5 failed to recognize the nutritional superiority of fresh milk over powdered milk. As discussed earlier, 41% of respondents had a perfect knowledge about this statement. Obviously, there exists a clear division of opinion about the relative nutritive value of fresh milk and milk powder. No gender or age effect was seen on this misconception. Among those who held this misconception there were more Sinhalese (55%), Buddhists (55%), rural (49%) dwellers and respondents having up to A/L certificates (30%). It is obvious that advertisement campaigns undertaken by the milk powder companies have become more effective than the recent fresh milk promotional programs conducted by the Sri Lankan Government. Sri Lanka spent 400 Million USD to import milk powder (Mendis and Edirisinghe, 2014) and has been reported to have as low as 17ml of per capita milk consumption (Food Balance Sheet, 2012). Under these circumstances, negative influences of misconceptions about the nutritional importance of fresh milk on national nutritional status and economy could be substantial.

Interestingly, 13.8% of respondents did not identify prawn and crabs as high cholesterol containing ASF items. Except age, other demographic variables also influenced this misconception. Among the respondents those who hold this misconception, there were more Sinhalese (64%), Buddhists (64%), rural dwellers (60%), females (60%) and A/L qualified respondents. This is the only misconception on which gender had an effect. The male seems to have been more aware about cholesterol related issues than the female. Though the misconceptions are lowest among graduates, same was higher among A/L qualified responds than below that level. Furthermore, all the four misconceptions discussed above were low among estate workers than rural and urban dwellers. It is hypothesized that lower educated people and those in lower socio-economic backgrounds are not completely certain about the idea they hold. Consequently, they might have given many -0.66 and -0.33 which would otherwise have been -1 responses.

An ASF can make a better contribution towards the nutrition if it is widely accepted by many. A dietary preference survey conducted with urban respondents revealed that except beef and pork other ASF items are readily accepted by many (Table 04). This indicates that apart from a few well known ASF items such as beef and pork, social and individual prohibitions has a little effect on the level of consumption. The knowledge score as affected by whether each food item is accepted or not is given in Table 4. The nutritional knowledge was low among those who do not accept ASFs such as chicken, sausages, meatballs, eggs and fish. An individual consumes a particular ASF only if it is acceptable to him. Results of this study suggests that knowledge about ASF directly effects the acceptance and thereby the level of consumption. However, further researches are needed to ascertain the strength of that influence. Sausage and meatballs are normally popular among and affordable only to higher SES respondents. Consequently, higher knowledge score may reflect the general trend of having higher knowledge among them. However, it is noted that for many items the number of respondents who do not accept was low.

Table 04: Percentage knowledge score of the urban dwellers as affected by whether each ASF item is accepted or not

ASF item	% of respondents accept	% knowledge score of the respondents who accept or not each ASF item		P value
		Yes	No	
Chicken	93	35.0±1.1	25.0±4.0	0.01
Beef	44	35.3±1.6	33.4±1.4	NS
Mutton	68	34.6±1.3	33.8±1.9	NS
Pork	34	34.0±1.8	34.7±1.3	NS
Sausages	75	35.8±1.2	29.7±2.1	0.01
Meatballs	75	35.5±1.2	30.5±2.1	0.05
Egg	94	34.7±1.1	27.5±4.3	0.08
Fish	96	34.8±1.0	22.2±5.1	0.01
Sprat	88	34.3±1.1	33.7±3.0	NS
Crabs	81	34.7±1.1	32.4±2.4	NS
Prawn	88	34.7±1.1	31.3±3.1	NS
Canned fish	84	34.9±1.1	30.7±2.6	NS
Dried fish	89	34.4±1.1	32.7±3.2	NS
Maldives fish	94	34.2±1.1	35.0±4.3	NS
Fresh milk	94	34.3±1.1	33.9±4.5	NS
Goat milk	88	34.4±1.1	33.2±3.2	NS
Milk powder	87	34.8±1.1	30.9±3.0	NS
Yoghurt	99	34.2±1.0	36.1±9.0	NS
Cheese	93	34.4±1.1	32.0±4.0	Ns
Curd	96	34.3±1.1	33.9±5.2	NS

NS, p>0.05

CONCLUSIONS

Nutrition knowledge about ASF among Sri Lankans were found to be low and influenced by the ethnicity, religion, dwelling and the education level. The most prevalent misconceptions were about the relative nutritive value between brown and white eggs and fresh milk and milk powder and, the maximum safe intake level of egg. Importance of awareness programs about the ASF, particularly targeting estate dwelling Tamil communities is highlighted.

REFERENCES

Al-Isa, A.&Alfaddagh,A. (2014)Nutritional knowledge among Kuwaiti college students. Health, v.5, pp448-453. DOI: http://dx.doi.org/10.4236/health.2014.65063

Anderson, J. R 4th (ed), Cognitive psychology and its implications (1995). W.H. Freeman and Company, New York. DOI: http://dx.doi.org/10.1207/s15328023top0904_24

Axelson, M. L.,Federline, T.L.&Brinberg, D. (1985) A meta-analysis of food-and nutrition-related research. Journal of NutritionEducation, v.17(2),pp 51-54. DOI: http://dx.doi.org/10.1016/s0022-3182(85)80175-8

Brown, D. J.& Schrader, L.F. (1990) Cholesterol information and shell egg consumption. American Journal ofAgriculturalEconomics,v. 72(3),pp. 548-555. DOI: http://dx.doi.org/10.2307/1243023

Crawford, D. A. &Baghurst, K.I. (1990) Diet and health: a national survey of beliefs, behaviours and barriers to change in the community. Australian Journal ofNutrition and Dietetics,v. 47(4) pp. 97-104. DOI: http://dx.doi.org/10.1111/jhn.12554

Dallongeville, J.,Marécaux, N., Cottel, D., Bingham, A.&Amouyel, P. (2004)Association between nutrition knowledge and nutritional intake in middle-aged men from Northern France.Public Health Nutrition.4.pp.27–33. DOI: http://dx.doi.org/10.1079/phn200052

Food Balance Sheet(2014), Sri Lanka.Department of Census and Statistics, Sri Lanka.http://www.statistics.gov.lk/agriculture/FoodBalanceSheet/Food%20Balance%20Sheet%202013.pdf. Last visited 27th Dec 2017. DOI: http://dx.doi.org/10.1163/2213-2996_flg_com_174160

Food Based Dietary Guidelines for Sri Lanka. Nutrition Division, Ministry of Health, Sri Lanka. http://203.94. 76.60/departmnt/NutritionDivision/Nutrition%20Guidelines/ FBDG-English. pdf. Last accessed on 27th Dec 2017. DOI: http://dx.doi.org/10.4038/sljch.v43i1.6661

Gittelsohn, J.&Vastine, A.E. (2003) Sociocultural and household factors impacting on the selection, allocation and consumption of animal source foods: current knowledge and application. Journal of Nutrition. 133(11): 4036S-4041S. DOI: http://dx.doi.org/10.1093/jn/133.11.4036s

Hansbro, J., Bridgwood, A., Morgan,A.&Hickman, M. (1997) Health in England 1996: what people know, what people think, what people do. A Survey of Adults aged 16-64 in England Carried out by Social Survey Division ONS on Behalf of Health Education Authority of Stationery Office. DOI: http://dx.doi.org/10.1787/9789264065482-en

Harnack, L., Block, G., Subar, A., Lane, S.& Brand, R. (1997) Association of cancer prevention-related nutrition knowledge, beliefs and attitudes to cancer prevention dietary behavior. Journal of American Dietetic Association,v.97,pp. 957–965. DOI: http://dx.doi.org/10.1016/s0002-8223(97)00231-9

Hendrie, G.A., Coveney, J. & Cox, D.(2008) Exploring nutrition knowledge and the demographic variation in knowledge levels in an Australian community sample.Public Health and Nutrition.,v.11,pp. 1365-1371 DOI: http://dx.doi.org/10.1017/s1368980008003042

Hsu, J. L.,Liu, K.E., Huang,M.H.&Lee, H.J. (2008) Consumer knowledge and risk perceptions of avian influenza. PoultryScience,v. 87(8),pp. 1526-1534. DOI: http://dx.doi.org/10.3382/ps.2008-00105

Jayawardena, P.(2014)Underlying causes of child and maternalmalnutrition in the estate sector of Sri Lanka.JournalofSouth Asian Studies,v. 2(3),pp. 241-255. DOI: http://dx.doi.org/10.4038/sljch.v30i2.840

Kaabia, M. B.,Angulo,A.M.&Gil, J.M.(2001) Health information and the demand for meat in Spain. EuropeanReviewofAgriculturalEconomics,v. 28(4),pp. 499-517. DOI: http://dx.doi.org/10.1093/erae/28.4.499

Kinnucan, H. W., Xiao, H., Hsia,C.J.&Jackson, J.D.(1997) Effects of health information and generic advertising on US meat demand. American Journal of Agricultural Economics,v.79(1),pp. 13-23. DOI: http://dx.doi.org/10.2307/1243939

Larsson, S. C. &Orsini, N.(2013) Red meat and processed meat consumption and all-cause mortality: a meta-analysis. American Journal ofEpidemiology,v. 179(3),pp.282–289. DOI: http://dx.doi.org/10.1093/aje/kwt261

Levy, A. S., Fein, S.B.& Stephenson, M.(1993) Nutrition knowledge levels about dietary fats and cholesterol: 1983-1988. Journal ofNutritionEducation,v.25(2),pp. 60-66. DOI: http://dx.doi.org/10.1016/s0022-3182(12)80963-0

Murphy, S.P.& Allen, L.H. (2003) Nutritional importance of animal source foods. Journal of Nutrition,v. 133(11): 3932S-3935S. DOI: http://dx.doi.org/10.1093/jn/133.11.3932s

Murphy, S.P.&Lindsay,L.H..(2003) Nutritional importance of animal source foods. Journal of Nutrition,v. 133: 3932S- 3935S. DOI: http://dx.doi.org/10.1093/jn/133.11.3932s

Neumann, C., Harris, D.M.& Rogers, L.M.(2002) Contribution of animal source foods in improving diet quality and function in children in the developing world.Nutrition Research. 22,pp. 193-220. DOI: http://dx.doi.org/10.1016/s0271-5317(01)00374-8

Parmenter, K., Waller, J.& Wardle, J. (2000) Demographic variation in nutrition knowledge in England. Health educationResearch,v. 15(2),pp. 163-174 DOI: http://dx.doi.org/10.1093/her/15.2.163

Randolph, T.F., Schelling, E., Grace, D., Nicholson, C.F., Leroy, J.L., Cole, D.L., Demment, M.W., Omore, A., Zinsstag, A. &Ruel, M. (2007) Invited review: Role of livestock in human nutrition and health for poverty reduction in developing countries. International Journal of AnimalScience,v. 85,pp. 2788-2800. DOI: http://dx.doi.org/10.2527/jas.2007-0467

Smith, J., Sones, K., Grace, D., MacMillan, S., Tarawali,S.&Herrero, M.(2012) Beyond milk, meat, and eggs: Role of livestock in food and nutrition security. AnimalFrontiers,v. 3,pp. 6-13. DOI: http://dx.doi.org/10.2527/af.2013-0002

Spronk, I., Kullen, C., Burdon, C.& O'Connor, H. (2014) Relationship between nutrition knowledge and dietary intake. BritishJournal of Nutrition,v.111 (10),pp. 1713-1726. DOI: http://dx.doi.org/10.1017/s0007114514000087

Tate, J. & Cade, J. (1990) Public knowledge of dietary fat and coronary heart disease. Health EducationJournal,v. 49(1),pp. 32-35. DOI: http://dx.doi.org/10.1177/001789699004900112

Wardle,J., Parmenter,K. & Waller, J. (2000) Nutrition knowledge and food intake. Appetite, 34,pp. 269-275. DOI: http://dx.doi.org/10.1006/appe.1999.0311

Worsley, A. (2002) Nutrition knowledge and food consumption: can nutrition knowledge change food behaviour?. Asia Pacific journal of Clinical Nutrition,v. 11(s3): S579-S585. DOI: http://dx.doi.org/10.1046/j.1440-6047.11.supp3.7.x

Yen, S. T., Lin, B.H. &Davis, C.G.(2008) Consumer knowledge and meat consumption at home and away from home. Food Policy,v. 33(6),pp. 631-639. DOI: http://dx.doi.org/10.1016/j.foodpol.2008.02.006