Women (and men) perceive benefits of fish consumption differently: Empirical evidence from Kerala, India

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Fish Consumption: Importance in a healthy diet

- The role of fish and fish products in providing a healthy balanced diet is appreciated all over the world.
- Fish being a rich source of animal protein is recommended for various age groups as one of the healthiest options to mitigate hunger and ensure food and nutrient security.
- Around 4.4 billion people depend on fish to meet between 15-20% of their total animal protein intake.
- Globally, there is growing recognition of the role of fish and seafood in food security and nutrition, as a provider of protein, a unique source of omega-3 fatty acids and bio-available micronutrients.
- Consumers also perceive fish as a healthy food compared to other non-vegetarian foods.

KEY NUTRIENTS IN SEAFOOD:

Long chain omega-3 fats

Mainly found in fish and seafood, these fatty acids are essential for optimal brain development.

Iodine

Seafood is in practice the only natural source of this crucial nutrient. Iodine serves several purposes like aiding thyroid function. It is also essential for neurodevelopment.

Vitamin D

Another nutrient crucial for mental development, this vitamin also regulates the immune system function and is essential for bone health.

Iron

During pregnancy, iron intake is crucial so that the mother can produce additional blood for herself and the baby.

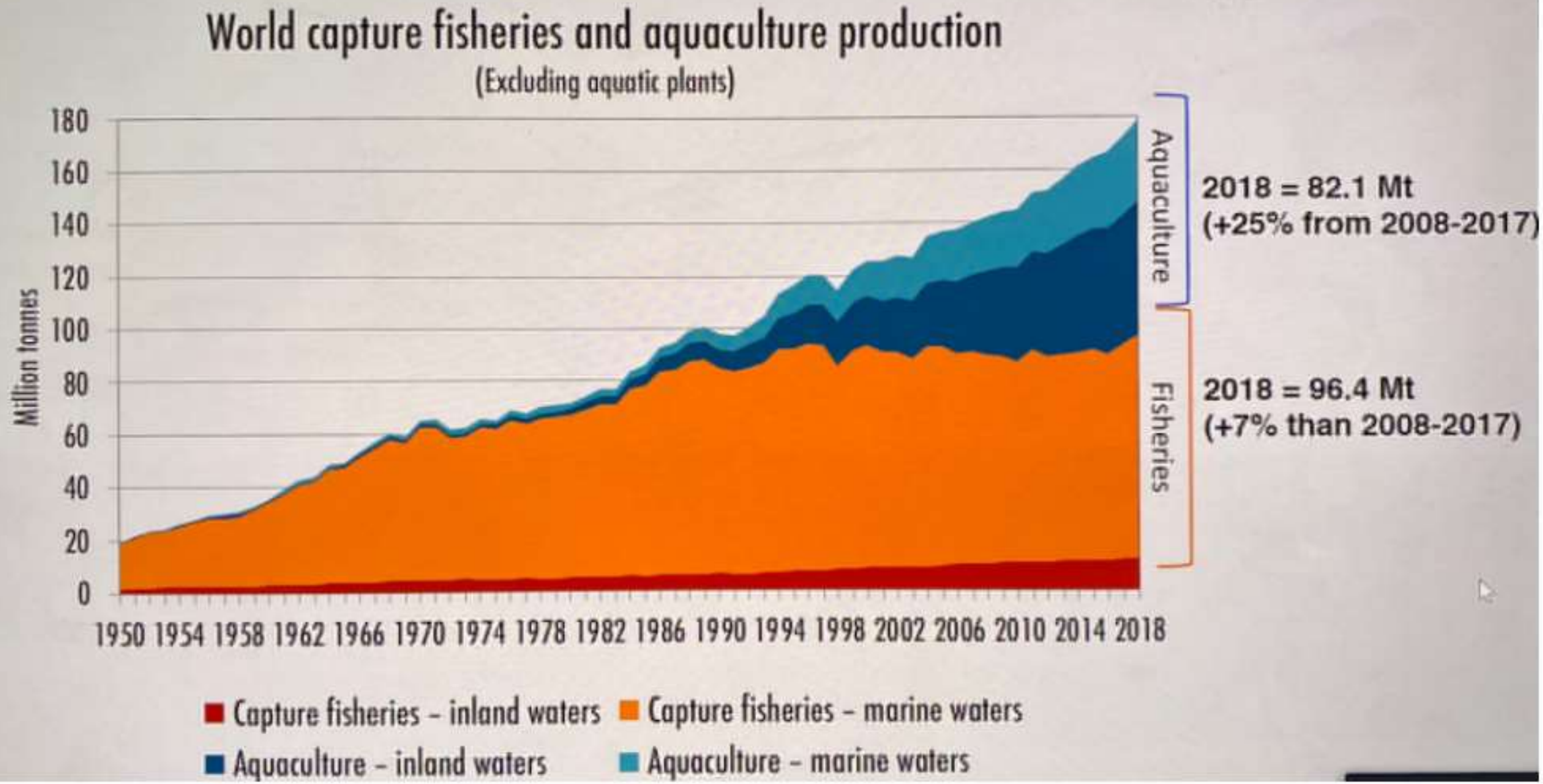
Calcium, zinc, other minerals

Diets without dairy products often lack calcium, and zinc deficiency slows a child's development.

Food and Agriculture Organization of the United Nations

WORLD PRODUCTION: A RECORD 179Mt

SOFIA 2020



Fish Production: Global Status

TABLE 1 WORLD FISHERIES AND AQUACULTURE PRODUCTION, UTILIZATION AND TRADE[1]

	1990s	2000s	2010s	2018	2019	2020
	Average per year					
	Million tonnes (live weight equivalent)					
Production						
Capture:						
Inland	7.1	9.3	11.3	12.0	12.1	11.5
Marine	81.9	81.6	79.8	84.5	80.1	78.8
Total capture	**88.9**	**90.9**	**91.0**	**96.5**	**92.2**	**90.3**
Aquaculture:						
Inland	12.6	25.6	44.7	**51.6**	**53.3**	**54.4**
Marine	9.2	17.9	26.8	**30.9**	**31.9**	**33.1**
Total aquaculture	**21.8**	**43.4**	**71.5**	**82.5**	**85.2**	**87.5**
Total world fisheries and aquaculture	**110.7**	**134.3**	**162.6**	**178.9**	**177.4**	**177.8**
Utilization[2]						
Human consumption	81.6	109.3	143.2	156.8	158.1	157.4
Non-food uses	29.1	25.0	19.3	22.2	19.3	20.4
Population (billions)[3]	5.7	6.5	7.3	7.6	7.7	7.8
Per capita apparent consumption (kg)	14.3	16.8	19.5	20.5	20.5	20.2
Trade						
Exports – in quantity	39.6	51.6	61.4	66.8	66.6	59.8
Share of exports in total production	*35.8%*	*38.5%*	*37.7%*	*37.3%*	*37.5%*	*33.7%*
Exports – in value (USD 1 billion)	46.6	76.4	141.8	165.3	161.8	150.5

[1] Excluding aquatic mammals, crocodiles, alligators and caimans and algae. Totals may not match due to rounding.
[2] Utilization data for 2018–2020 are provisional estimates.
[3] Source of population figures: United Nations. 2019. 2019 Revision of World Population Prospects. In: *UN*. New York. Cited 22 April 2022. https://population.un.org/wpp
SOURCE: FAO.

Fish Consumption: Global Status

- During the last five and half decades, global fish consumption in the form of food has recorded an increase at an average annual rate of 3.1 percent which is higher than the consumption growth rate of all other animal protein foods.
- Global per capita fish consumption/year has been found to increase at an average annual rate of 1.5 percent per year from 9 kg per capita in 1961 reaching a record 20.5 kg in 2019 and 20.2 kg in 2020.
- Some areas of the world record consumption of aquatic foods higher than the recommended 28g a day for adults, but consumption has been seen varying within countries, communities and households.

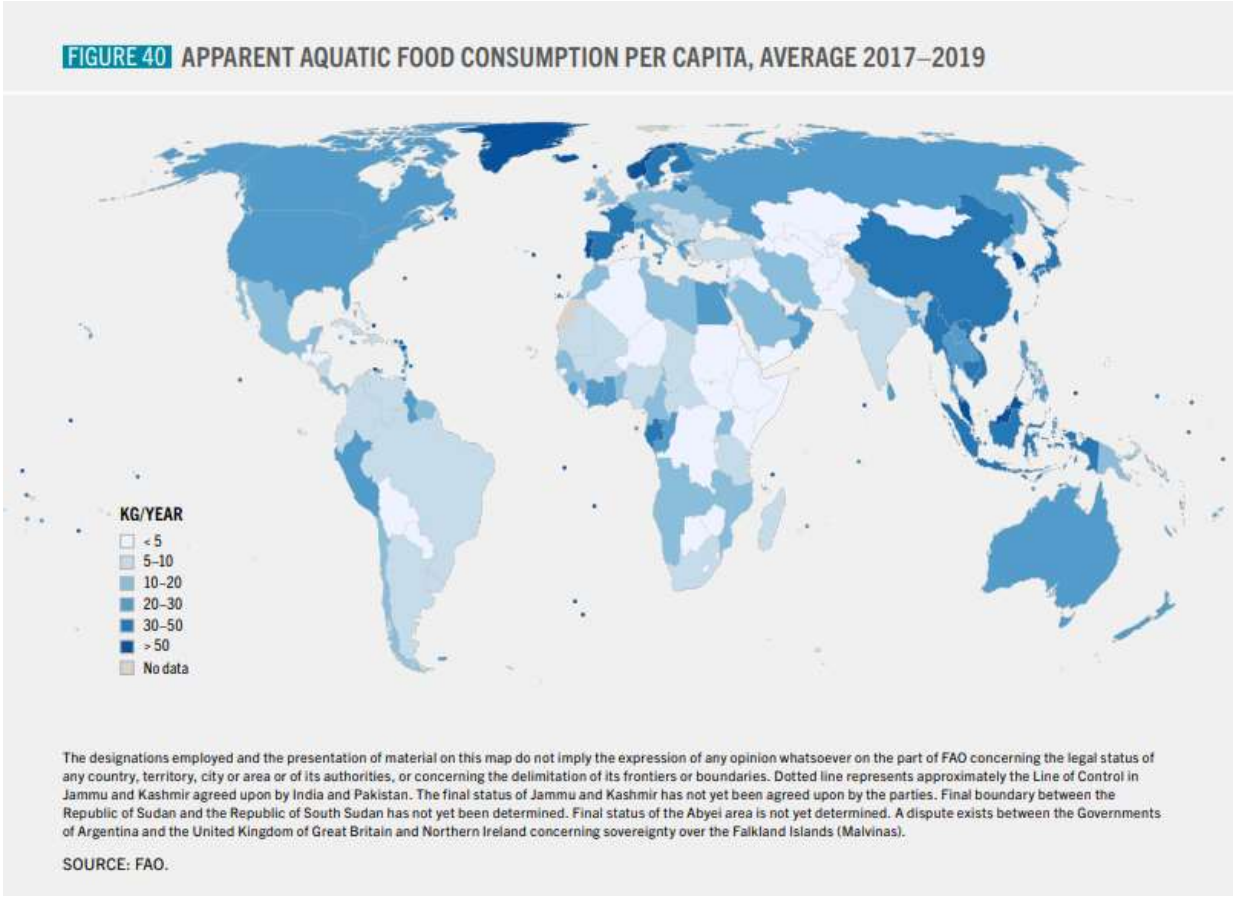


TABLE 14 TOTAL AND PER CAPITA APPARENT CONSUMPTION OF AQUATIC FOODS BY REGION AND ECONOMIC CLASS, 2019

Region/economic class	Total aquatic food consumption *(million tonnes, live weight equivalent)*	Per capita aquatic food consumption *(kg/capita/year)*
World	**157.7**	**20.5**
World, excluding China	100.3	16.0
Africa	**13.1**	**10.0**
Americas	**14.8**	**14.6**
North America	8.3	22.7
Latin America and the Caribbean	6.4	9.9
Asia	**113.1**	**24.6**
Europe	**15.8**	**21.1**
Oceania	**1.0**	**23.2**
High-income countries	**32.0**	**26.5**
Upper-middle-income countries	**72.2**	**28.1**
Lower-middle-income countries	**50.0**	**15.2**
Low-income countries	**3.5**	**5.4**

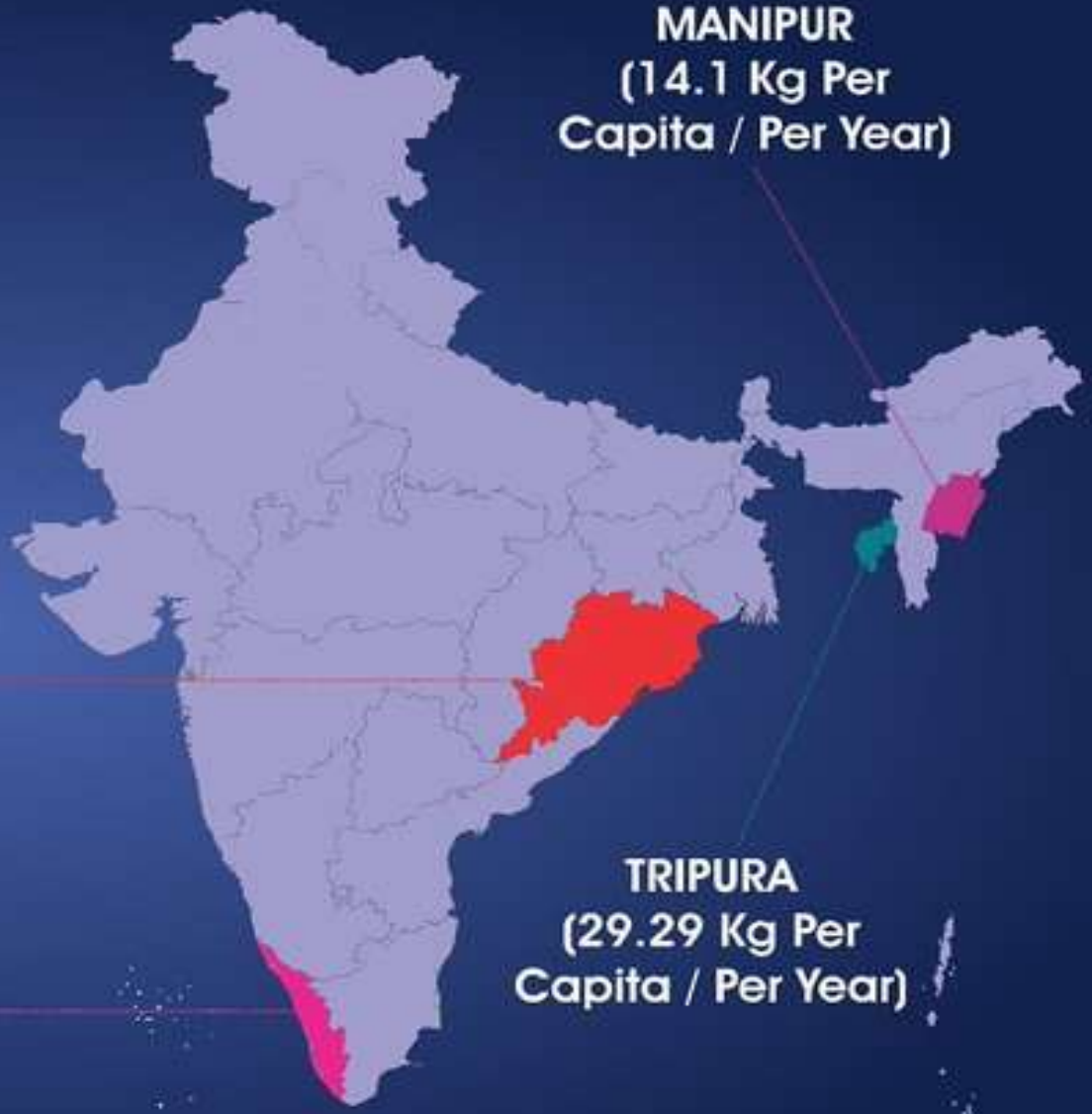
NOTE: Data are preliminary.
SOURCE: FAO.

Fish Consumption: Indian Status

- India shares 7.56% of the global fish production at an all-time high of 145.00 lakh metric tons (2020-21).
- A meager monthly per capita fish consumption of 0.27 kg in rural India and 0.25 kg in urban India (NSSO Report No: 558).
- Around 60 per cent of the Indian population consumes fish (NSSO Report No: 541) and the consumption pattern varies widely and across the different social fabric.
- The annual per capita consumption of fish for the fish-eating population of India was found to be 8-9 kg which is way below the Indian Council of Medical Research (ICMR) recommendation of 12 kg/annum.
- The World Bank predicts per capita fish consumption of 6.6 kg/year for India in 2030 which still falls way behind ICMR recommendation.

DEPARTMENT OF FISHERIES
Government of India

STATE WITH HIGHEST FISH CONSUMPTION: 2019-20



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Objectives of this study

- To assess the per capita consumption pattern among a highly fish consuming population
- To measure the perception differences among women and men fish consumers with reference to health, safety and quality issues in inland vs coastal and rural vs urban settings.
- To provide gender specific recommendations for science communication with respect to benefits of fish consumption.

Methodology

- Highly fish consuming state of Kerala, India purposively selected for the study
- Purposive random sampling method was followed and 400 consumers covering 263 women and 137 men fish consumers from 2 coastal districts (Ernakulam and Kozhikode) and 2 inland districts (Kottayam and Palakkad) of Kerala State, India were surveyed.
- The perception statements were developed under three conceptual dimensions of nutritional- health benefits of fish, quality concerns and safety issues in fish consumption.
- Each household was visited and one adult respondent most involved in fish purchase and cooking was personally interviewed.

Study of fish consumption patterns

Frequency of fish consumption

(n=400)

Frequency	Ernakulam (%)	Kozhikkode (%)	Palakkad (%)	Kottayam (%)
Daily	40	64	8	29
2-3 times a week	46	29	38	67
Weekly once	9	3	21	2
1-2 times a month	4	1	25	1
Rarely	1	3	8	1

Most purchased and favourite fishes

(n=400)

- Sardine was identified as the most purchased and favourite fish among all the districts studied followed by Mackerel.
- Pearl spot (Ernakulam), Pomfret (Kozhikkode), Prawns and Catla (Palakkad) and Seer fish and Tuna (Kottayam) were the next most favourite fishes for which cost and availability in local markets acted as deterrent in frequent purchase.

Purchase of fish v/s other Non-veg items and milk

(n=400)

Item (kg/Family/month)	EKM (kg/m)	KKD (kg/m)	PKD (kg/m)	KTM (kg/m)	KERALA
Fish per capita	3.21	3.05	1.85	3.65	2.94
Fish	13.28	12.97	7.50	13.78	11.71
Chicken	4.10	3.40	3.88	5.00	4.10
Mutton	2.12	2.13	0.57	2.06	1.72
Beef	2.70	2.80	1.37	2.21	2.27
Pork	1.43	-	0.08	1.95	0.87
Duck	1.90	-	-	1.47	0.84
Eggs nos/m	35	28	25	34	31
Milk ltr/m	20	15	18	24	19
Avg mon exp (Rs)	5097	3685	3075	5578	4349

Per capita and monthly fish consumption

- Monthly fish consumption of the households surveyed varied between one kg to 50 kg
- Estimated as 11.71 kg

- Percapita fish consumption was estimated as 0.11 kg to 9.33 kg per month
- Estimated as 2.94 kg

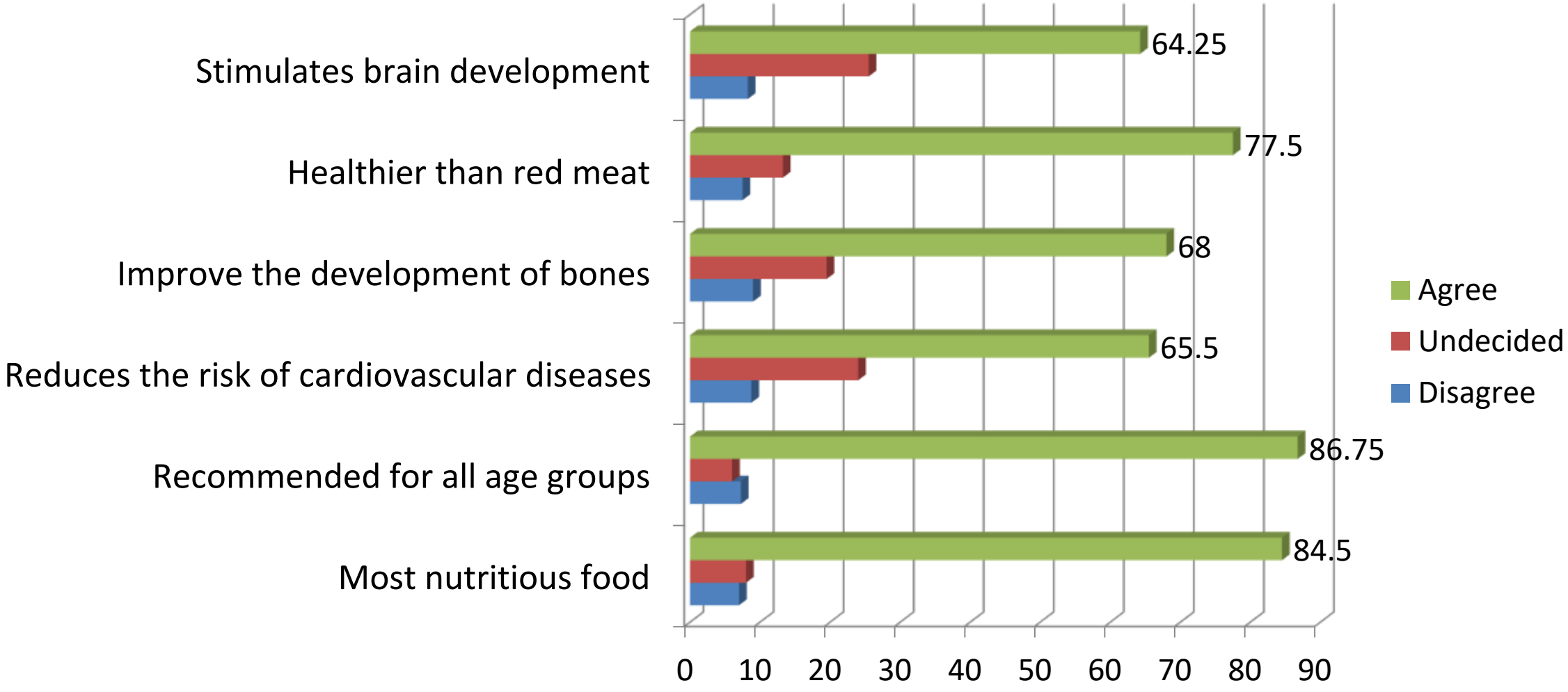
Comparison of monthly fish consumption of coastal vs inland district households

- Coastal district households had a significantly higher monthly fish consumption (t= 3.619, p= 0.000) and a significantly higher percapita fish consumption than that of inland district households (t= 2.027, p= 0.043)

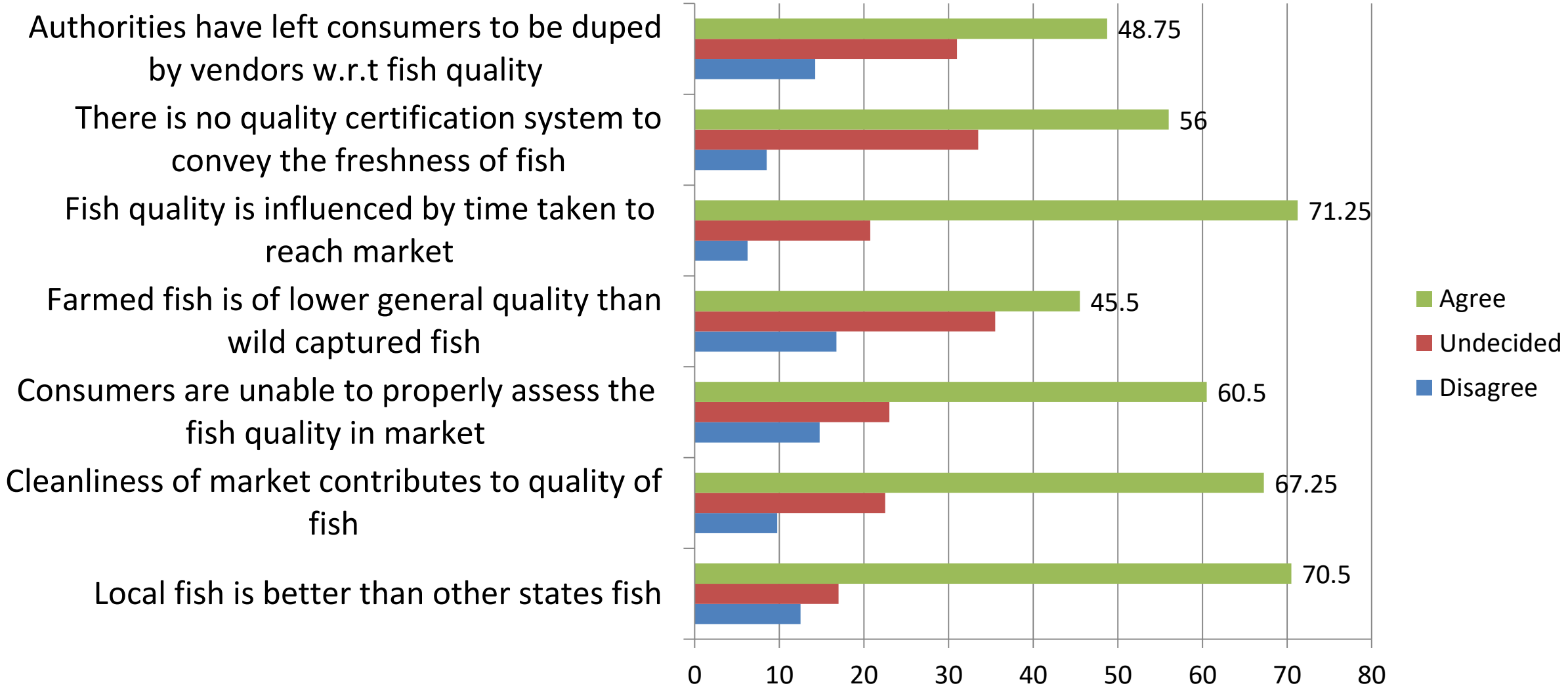
Parameters	Type of district	Mean value (kg/month)	Standard deviation	t	p
Monthly fish consumption of households	Coastal	12.89	8.01	3.619	0.000
	Inland	10.30	6.17		
Percapita fish consumption	Coastal	3.13	1.97	2.027	0.043
	Inland	2.03	1.75		

Perception of fish consumers on health benefits, quality and safety

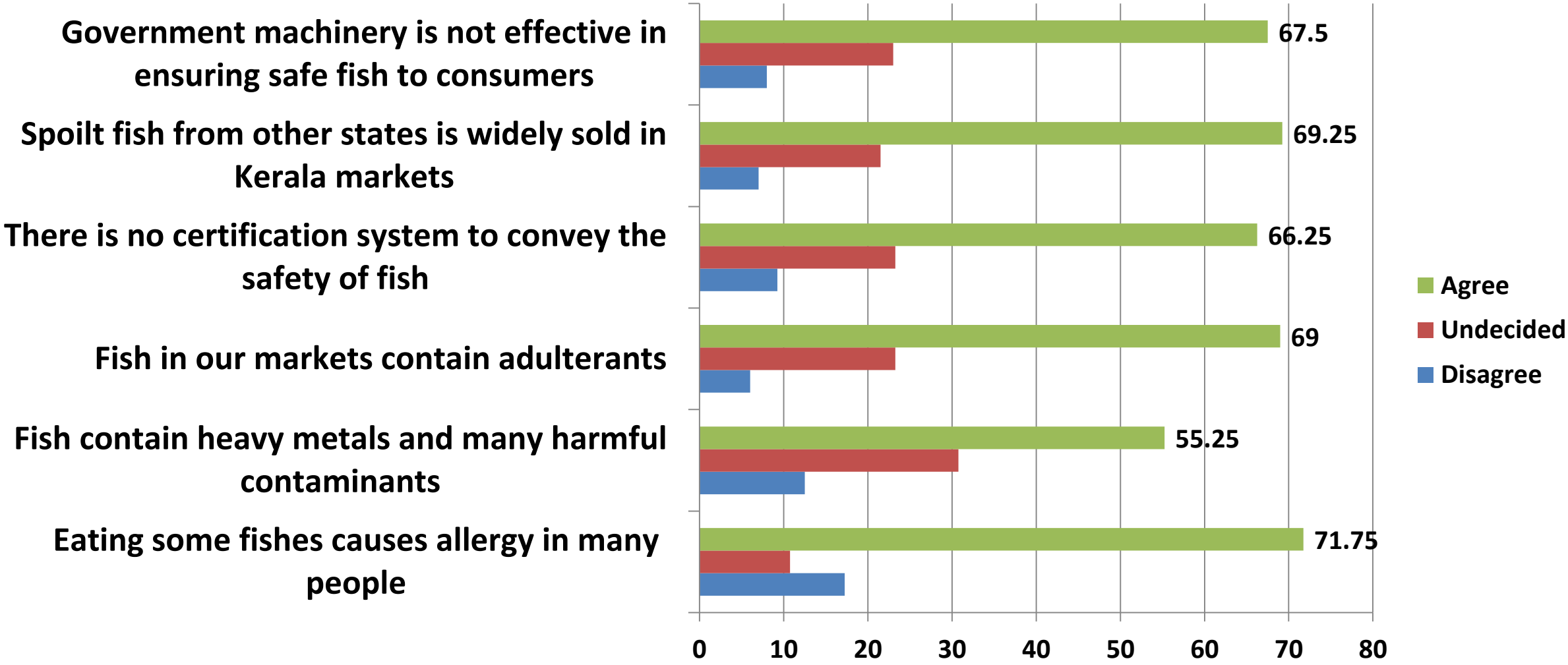
Distribution of fish consumers based on their perception about health benefits of fish



Distribution of fish consumers based on their perception about quality of fish



Distribution of fish consumers based on their perception about safety of fish



Perception of rural vs. urban women (Kruskal-Wallis test results)

Perception statements	Mean rank				
	Rural	Semi-urban	Urban	χ^2	p
Overall nutritional- health perception	183.04	212.02	220.43	8.993	.011
Local fish is having better quality than the fish coming from other states	181.03	215.48	197.48	6.208	.045
Consumers are unable to properly assess the fish quality in market	203.94	196.51	160.94	12.769	.002
Fish quality is influenced by time taken to reach market after capture	204.77	188.56	164.79	11.062	.004
There is no certification system to convey the safety of fish	201.20	183.41	169.26	7.103	.029
Government machinery is not effective in ensuring safe fish to consumers	201.85	193.80	167.90	8.004	.018

Perception of rural vs. urban women

- Urban women had a significantly higher perception about health benefits of fish than semi-urban and rural women consumers (p=0.011).
- Semi-urban women had stronger perception that local fish is having better quality than the fish coming from other states as shown by Kruskal-Wallis test (p=0.045).
- But surprisingly, rural women consumers had more concern about lack of certification system than urban women to convey the safety of fish (p=0.029) and about inefficiency of government machinery for ensuring safe fish to consumers (p=0.018).

Perception of men vs women

Perception statements	Mean rank			
	Men	Women	Mann-Whitney U	p
Fish consumption reduces the risk of cardiovascular diseases	169.24	194.31	13190.500	.024
Fish quality is influenced by time taken to reach market after capture	210.83	176.45	12811.000	.002
Eating some fishes causes allergy in many people	168.88	203.88	13440.000	.002
There is no certification system to convey the safety of fish	212.27	174.26	12341.500	.001
Overall nutritional- health perception	182.95	208.82	15565.500	.033

Perception of men vs women

- Women had a significantly higher perception than men with respect to health benefits of fish (p=0.033) depicting her effort in garnering nutrition knowledge to ensure the health requirement of her family.
- As men had more exposure to fish markets and other places concern about fish quality during transportation (p=0.002) and lack of certification system for safety of fish (p=0.001) was stronger among men than among women.

Conclusions and recommendations

- Women and men recorded equal and very high percapita fish consumption to the tune of roughly 36 kg/year in Kerala, India
- Significant difference in consumption was observed wherein coastal households had a significantly higher (12.89kg) monthly fish consumption and a significantly higher per capita fish consumption (3.13kg) than that of inland district households.
- Women recorded a significantly higher perception than men with respect to nutrition and health benefits of fish depicting her effort to ensure the nutritional requirement of her family.
- Men require more customized information about health benefits of fish,
- Women were in need of customized information on quality and safety risks associated with fish consumption.
- The findings calls for *better customisation of scientific communication about nutrition and health benefits of fish specifically designed for members of both genders residing in coastal and inland regions.*

Thank you

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