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Result of a Questionnaire Survey of 61 Females on their Satisfaction with Fish, Calcium and Protein Intake

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Abstract- Since the calcium intake has not reached the target amount of 600 ~ 800 mg per day in the Japanese diet, calcium intake is recommended in the daily diet. And in recent years, Japan has been promoting protein intake for the elderly to prevent sarcopenia and frailty. Japan also recommended to take EPA and DHA to maintain smooth blood vessels and memory maintenance. Therefore, as a first step to understanding the actual situation, this study conducted a questionnaire survey on the information of fish rich in EPA and DHA and the intake of Ca and protein.

Sixty-one participants were given a self-anubnustered questionnaire regarding fish, calcium and protein intake. The questionnaire method is self-administered, and the questions are about age, height, weight, and desired purchase price of fish. We asked the following questions, frequency of eating fish, frequency of eating meat, frequency of eating eggs, and frequency of eating bean products.

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Sixty-one participants were given a self-anubnustered questionnaire regarding fish, calcium and protein intake. The questionnaire method is self-administered, and the questions are about age, height, weight, and desired purchase price of fish. We asked the following questions, frequency of eating fish, frequency of eating meat, frequency of eating eggs, and frequency of eating bean products. Do you like eating fish?, Do you know that there are fish for sale that you can eat up to the bones?, Do you want to eat that fish? Do you feel calcium deficiency?, Do you want to take calcium positively?, Do you think protein deficiency?, Do you want to take protein positively?. There were 15 items. The mean ± standard deviation of 61 participants (18 to 28 years old) was 21.1 ± 2.0 years of age, the height of 158.4 ± 5.9 cm, and weight of 52.9 ± 7.1 kg. According to the results of the questionnaire survey, the average desired price for purchasing fish was 266 ± 162 Japanese yen (2.2±1.35 USD), the frequency of eating fish was most often 1 to 2 times a week at 41.0%, and the frequency of eating meat was most often 3 to 4 times a week at 67.2%. By participants, eggs were most often eaten 3 to 4 times a week at 47.5%. And by participants, soy products were most often eaten 1 to 2 times a week at 34.4%. 83.6% answered whether they like to fish, and 75.4% answered yes to knowing fish that can eat bones. And 82.0% answered yes to wanting to eat fish that can eat bones. 68.9% answered yes to whether they felt a lack of calcium, and 95.1% respponded yes to whether they wanted to take calcium positively. 32.8% of the respondents answered yes to whether they thought protein deficiency, and 90.2% answered yes to whether they wanted to take protein positively. Participants, this time, ate meat and eggs more often than fish and bean products in their daily lives. He also wanted to buy fish for around 270 yen. From the results of the questionnaire survey, 70% of the participants felt calcium deficiency. And more than 90% of the participants answered that they would like to actively take calcium and protein. Based on these results, it is expected that if the purchase price of fish were to fall below the current level, the frequency of consumption by participants would increase, as with eggs and meat. We believe that it is necessary to increase the consumption of fish to extend healthy life expectancy, so we would like to continue to recommend the consumption of fish.

Keywords: questionnaire surveys, consumption of fish, calcium intake, protein intake.

I. Introduction

In Japan, the Ministry of Health, Labor and Welfare publishes dietary standards for Japanese every five years. According to the Japanese Dietary Intake Standards issued by the Ministry of Health, Labor and Welfare in 2020, the daily protein intake for adults is 60g for males and 50g for females.

Per capita consumption of seafood in Japan continues to decline. According to the Japanese "Food Supply and Demand Chart," the consumption of edible seafood per person per year, peak intake of fish per person is 40.2 kg in 2001, but peak intake of fish per person is 24.6 kg in 2016 which is 1.1 kg less than the previous year. This fish intake is about the same level as in the late 1930s.In recent years, in Japan, protein intake is starting to decrease. This is thought to be due to factors such as the aging of the population. Calcium intake in Japan is much less than the recommended amount of 800～700mg for males and 650～600mg for females. The recent calcium intake in Japan is 470～550mg for males and 400～500mg for females. That is nearly 250mg less than the recommended amount.

Data from 1995 to 2015 show that Japanese protein intake is declining. Total protein may be sufficient, but animal proteins are too few, and it can be said that the Japanese lack “good quality protein.”That means that the amino acid score does not exceed 100.

The 61 females (18-28) who participated in a health class were asked about satisfaction with their intake of fish, calcium, and protein intake.

II. Materials and Methods

Participants were 61 females who were briefed about the study and signed a consent form. The questions consisted of the following seven items. 1) Do you like fish to eat? 2) Do you know a commercial fish that can eat up to the bones? 3) Would you like to eat a

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fish that can be eaten up to the bones of a commercial product? 4) Do you feel that you are deficient in calcium intake daily? 5) Do you want to take calcium positively? 6) Do you feel that you are deficient in protein intake daily? 7) Do you want to take protein positively? Participants self-administered responses to a seven-item questionnaire. In addition, participants were asked about their frequency of consumption of fish, meat, eggs, and beans using a self-administered questionnaire. The participants also answered the desired purchase price of the fish whose bones are edible.

III. Results

61 participants aged 18 to 28 years (see Table 1.), and the average age ± standard deviation was 21.1 ± 2.0. Weight was 52.9±7.1, and height was 158.4±5.9 (see Table 2.).

Table 1. Age distribution of 61 participants

years old	18	19	20	21	22	23	24	25	26	27	28
number of participants	3	7	14	20	7	2	3	2	2	0	1

Table 2. Basic information of 61 participants

	Average age	Average height	Average weight
Average±Standard diviation	21.1 ±2.0	158.4 ±5.9	52.9 ±7.1

Table 3 shows the results of a seven-item self-administered questionnaire conducted on the participants. Among the participants, 83.6% answered that they like to fish. The participants of 75.4% responded that they know a commercial fish that can eat up to the bones. Among the participants, 82.0% answered that they would like to eat a commercial product of fish whose bones are edible. In addition, 68.9% of the participants answered that they felt calcium deficiency in their daily lives. And 95.1% of the participants insisted on positive calcium intake. Similarly, 32.8% of the participants felt that they were not getting enough protein in their daily lives. The participants of 90.2% responded that they want to take protein positively.

Table 3. Questionnaire survery results on fish, calcium and protein intake of 61 participants (%)

Question items	Yes	No	No answer
Do you like fish to eat?	83.6	16.4	0.0
Do you know a commercial fish that can eat up to the bones?	75.4	24.6	0.0
Would you like to eat a fish that can be eaten up to the bones of a commercial product?	82.0	18.0	0.0
Do you feel that you are deficient in calcium intake on a daily basis?	68.9	29.5	1.6
Do you want to take calcium positively?	95.1	3.3	1.6
Do you feel that you are deficient in protein intake on a daily basis?	32.8	67.2	0.0
Do you want to take protein positively?	90.2	9.8	0.0

Participants filled out a self-administered questionnaire about the frequency of consumption of fish, meat, eggs, and beans (see Table 4.). Many participants responded to the question as follows. They ate fish 1-2 times a week, meat 3-4 times a week, eggs 3-4 times a week, and beans 1-2 times a week.

In addition, participants answered the following questions: 6.6% of participants ate meat every day, 23.0% of participants ate eggs every day, and 18.0% of participants ate beans every day. However, none of the participants ate fish every day.

Table 4. Results of a frequency survey of 61 participants eating fishs, meats eggs, and beans (%)

	1	2	3	4	5	6	7
	every day	5~6/week	3~4/week	1~2/week	2~3/month	1/month	rarely eat
Frequency of eating fishs	0.0	3.3	34.4	41.0	18.0	1.6	1.6
Frequency of eating meats	6.6	21.3	67.2	4.9	0.0	0.0	0.0
Frequency of eating eggs	23.0	18.0	47.5	11.5	0.0	0.0	0.0
Frequency of eating beans	18.0	13.1	29.5	34.4	4.9	0.0	0.0

Table 5 shows the results of a self-administered questionnaire survey of participants regarding the desired purchase price of commercially available fish that even the bones can be eaten. As a result, among the participants, the most requested price was 200 yen (about 1.5 US dollars). However, the reality is that the price of commercially available fish with edible bones in 400 yen (about 3-4 US dollars). It is about twice the purchase price requested by the participants.

Table 5. Desired purchase price of commercially available fish tha can eat up to bones
Average ± standard deviation = 266 ± 162 yen (Japanese yen)

Questions	50 yen	100 yen	120 yen	150 yen	180 yen	200 yen	250 yen	280 yen
Suggested purchase price (number)	1	5	1	8	1	16	5	2
Suggested purchase price (%)	1.6	8.2	1.6	13.1	1.6	26.2	8.2	3.3
Questions	298 yen	300 yen	350 yen	400 yen	500 yen	800 yen	1000 yen	no answer
Suggested purchase price (number)	1	7	2	5	4	1	1	1
Suggested purchase price (%)	1.6	11.5	3.3	8.2	6.6	1.6	1.6	1.6

IV. Discussions

From the results of a self-administered questionnaire survey conducted on 61 females, they did not feel a lack of protein, but felt a lack of calcium. However, 61 females wanted to consume both protein and calcium actively. The participants knew that even the bones of the fish were edible and tried to eat them, but the purchase price they wanted to buy them at a price far below the actual market price. Therefore, consumers consider fish that can be eaten, even the bones, expensive. As the protein in daily life, it is possible to purchase eggs, beans, and meat every day, but it is not easy to eat fish every day. Fish contain not only high-quality protein, but also large amounts of EPA and DHA1), which are suitable for blood vessels[2-4] and the brain[5]). In order to prevent Alzheimer's disease[6,7], it is desirable to take EPA and DHA, which are abundant in fish oil. They are also reported to be effective in preventing neuropathy[8] and leading to health promotion by numerous reports[9,10]. Eating fish for calcium[11] and for protein[12,13] intake is recommended. However, the high price of fish prevents consumers from purchasing fish daily. Even if it is challenging to buy raw fish, is it possible to increase the consumption of fish whose bones are edible by storing it at room temperature in retort pouches and using canned food?

Encourage consumers to consume processed fish caught in season (such as canned fish that can store for a long time and even the bones are edible) to increase protein and calcium intake.

V. Conclusions

Concerning the consumption of calcium, which did not meet the Japanese dietary intake standards, and the consumption of fish, which is declining a self-administered questionnaire survey was conducted on 61 females. As a result, the participants felt that their protein intake was sufficient, but felt that their calcium intake was low. The participants answered that they wanted to ingest both protein and calcium actively. The participants knew that there were fish available on the market that could be eaten, including the bones, from which calcium and protein could be ingested simultaneously, but they did not know that the price was higher than the asking price. Some participants ate eggs, meat, and beans daily, but none ate fish daily. In the future, we would like to introduce low-price canned fish and retort-pouch foods to consumers, increase the consumption of fish, even the bones which can be eaten, and increase the intake of calcium and protein.

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