

The Analysis of Hypothesis Testing on Popularities of Rare Sugars

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Abstract

The Rare Sugars exist naturally and have many kinds (more than 50). They have good effect for health such as prevention of increasing the blood-sugar level after eating, suppression of fat accumulation, suppression of increasing the blood pressure, and anti-oxidative effect etc. It is in the spotlight for many people especially for those who are in the metabolic syndrome. The Rare Sugars are prevailing now in Japan. It is utilized in cooking, drinks and cakes etc. The big food companies are putting it into their products and make promotions by TV and other media. There are few related papers concerning the marketing research and its utilization of this matter. In this paper, a questionnaire investigation is executed to the student of Kagawa Junior College in order to clarify consumers' current condition and their consciousness, and to seek the possibility of utilizing the Rare Sugars. Fundamental statistical analysis and Hypothesis Testing analysis are performed based on that. Some interesting and instructive results were obtained.

Keywords: rare sugars, health, consumer, hypothesis testing

1. Introduction

The Rare Sugars' study has launched on 1980th by Professor Takeshi Izumori (Kagawa University). The way to the mass production was developed by the method of enzymatic reaction. The International Society of Rare Sugars was established in 2001. Local government of Kagawa Prefecture comes to assist this research activity on this big innovation newly born in Kagawa Prefecture. The Rare Sugars have advantage that a blood-sugar level does not increase so much after eating, in spite of it being a sugar. And it also holds the upturn of the blood pressure. Therefore it is expected as a new functional material for the prevention of metabolic syndrome.

By the way, one kind of the Rare Sugar D-psicose has the following characteristics.

- ① a sweetening made by the natural starch
- ② non-calorie and its sweetness is 70% to those of sugar
- ③ organoleptic property of coolness and sharpness in taste

Many medical research papers are published on the Rare Sugars as follows.

Analysis of the function of D-psicose; Hossain et al., 2011, Hayashi et al., 2010, Iida et al., 2010

Analysis of the function of D-allose; Yamada et al., 2012, Kajikawa et al., 2010, Hirata et al., 2009

On the other hand, these are few papers analyzed by the viewpoint from consumers. The Rare Sugars is good for the health and is sold in the market as a sweetening, seasoning or functional ingredient for food. The Rare Sugars are prevailing now in Japan. It is utilized in cooking, drinks and cakes etc. The big food companies are putting it into their products and make promotions by TV and other media.

In this paper, a questionnaire investigation is executed to the student of Kagawa Junior College in order to clarify the recognition level among consumers and to pursue the future possibility of the Rare Sugars. Basic statistical analysis and Hypothesis Testing analysis are conducted. The nine issues are set and Hypothesis Testing analysis is executed.

The rest of this paper is organized as follows. In section 2, outline of the questionnaire investigation and its basic statistical results are exhibited. After that, Hypothesis Testing analysis is performed in section 3, which is followed

by the remarks of section 4.

2. Outline and the Basic Statistical Results of the Questionnaire Research

2.1 Outline of the Questionnaire Research

A questionnaire investigation is executed to the student of Kagawa Junior College in order to clarify the recognition level among consumers and to pursue the future possibility of the Rare Sugars. The outline of the questionnaire research is as follows. The questionnaire sheet is attached in Appendix.

- (1) Scope of investigation : Student of Kagawa Junior College
 (2) Period : (1) April – June 2015, (2) April – June 2017
 (3) Method : Leave until called for
 (4) Collection : Number of distribution (1) 186, (2) 335
 Number of collection (1)186 (collection rate 100.0%), (2) 335 (collection rate 100.0%)
 Valid answer (1)186, (2) 333

2.2 Basic Statistical Results

Now, we show the main summary results by single variable.

(1) Basic characteristics of answerers

Q32 Sex		
	Frequency	%
Male	30	9.0
Female	303	91.0
Total	333	100.0

Q33 Age		
	Frequency	%
-19	272	81.7
20-29	52	15.6
30-39	3	0.9
40-49	4	1.2
50-59	1	0.3
60-	1	0.3
Total	333	100.0

Q34 Occupation		
	Frequency	%
Student	324	97.9
Company Employee	3	0.9
Clerk of Organization	1	0.3
Housewife	1	0.3
Miscellaneous	2	0.6
Total	331	100.0

(2) Summary results for the items used in Hypothesis Testing

Q12 I want to know where I can buy it because I want to use it as a seasoning.						
	Think it very much	Slightly think so	Cannot say either	Slightly do not think so	Do not think so	Total
Frequency	54	111	108	45	13	331
%	16.3	33.5	32.6	13.6	3.9	100.0
Q13 I want to know where I can get information because I want to use it as a supplement.						
Frequency	104	112	83	23	9	331
%	31.4	33.8	25.1	6.9	2.7	100.0
Q14 I want to know the hospital where the Rare Sugar is used as a tool for treatment.						
Frequency	57	115	110	36	14	332
%	17.2	34.6	33.1	10.8	4.2	100.0
Q25 Do you take interest in a diet?						
Frequency	128	105	52	23	24	332
%	38.6	31.6	15.7	6.9	7.2	100.0
Q26 Are you careful for the health?						
Frequency	44	127	127	23	10	331
%	13.3	38.4	38.4	6.9	3.0	100.0
Q27 Do you take interest in the designated health food?						
Frequency	49	107	124	37	14	331
%	14.8	32.3	37.5	11.2	4.2	100.0

3. Hypothesis Testing

Hereinafter we make Hypothesis Testing analysis based upon the questionnaire investigation data.

(1) Setting Hypothesis

In the Hypothesis Testing analysis, nine issues are set as follows.

- A-1)** Those who want to know where he/she can buy it because he/she wants to use it as a seasoning have interest in a diet.
- A-2)** Those who want to know where he/she can buy it because he/she wants to use it as a seasoning are careful of his/her health.
- A-3)** Those who want to know where he/she can buy it because he/she wants to use it as a seasoning have interest in the designated health food.
- A-4)** Those who want to know where he/she can get information because he/she wants to use it as a supplement have interest in a diet.
- A-5)** Those who want to know where he/she can get information because he/she wants to use it as a supplement are careful of his/her health.
- A-6)** Those who want to know where he/she can get information because he/she wants to use it as a supplement have interest in the designated health food.
- A-7)** Those who want to know the hospital where the Rare Sugar is used as a tool for treatment have interest in a diet.
- A-8)** Those who want to know the hospital where the Rare Sugar is used as a tool for treatment are careful of his/her health.
- A-9)** Those who want to know the hospital where the Rare Sugar is used as a tool for treatment have interest in the designated health food.

Now, we set the following nine Null hypotheses.

- A-1)** There is not so much difference whether those who want to know where he/she can buy it because he/she

wants to use it as a seasoning have interest in a diet or not.

A-2) There is not so much difference whether those who want to know where he/she can buy it because he/she wants to use it as a seasoning are careful of his/her health or not.

A-3) There is not so much difference whether those who want to know where he/she can buy it because he/she wants to use it as a seasoning have interest in the designated health food or not.

A-4) There is not so much difference whether those who want to know where he/she can get information because he/she wants to use it as a supplement have interest in a diet or not.

A-5) There is not so much difference whether those who cannot guess how he/she should use the Rare Sugar to what kind of cooking are careful of his/her health or not.

A-6) There is not so much difference whether those who want to know where he/she can get information because he/she wants to use it as a supplement have interest in the designated health food or not.

A-7) There is not so much difference whether those who want to know the hospital where the Rare Sugar is used as a tool for treatment have interest in a diet or not.

A-8) There is not so much difference whether those who want to know the hospital where the Rare Sugar is used as a tool for treatment are careful of his/her health or not.

A-9) There is not so much difference whether those who want to know the hospital where the Rare Sugar is used as a tool for treatment have interest in the designated health food or not.

(2) Hypothesis Testing

The results of Hypothesis Testing analysis are as follows.

Null Hypothesis A-1): There is not so much difference whether those who want to know where he/she can buy it because he/she wants to use it as a seasoning have interest in a diet or not.

Summary table for Null Hypothesis **A-1)** is exhibited in Table 1.

Table 1. Summary table for Null Hypothesis **A-1)**

Do you take interest in a diet?		I want to know where I can buy it because I want to use it as a seasoning.		
		Think so	Cannot say either/ Do not think so	Total
Think so	Frequency	130	102	232
	%	56.0	44.0	100.0
Cannot say either/ Do not think so	Frequency	35	62	97
	%	36.1	63.9	100.0
Total	Frequency	165	164	329
	%	50.2	49.8	100.0

significance probability 0.001

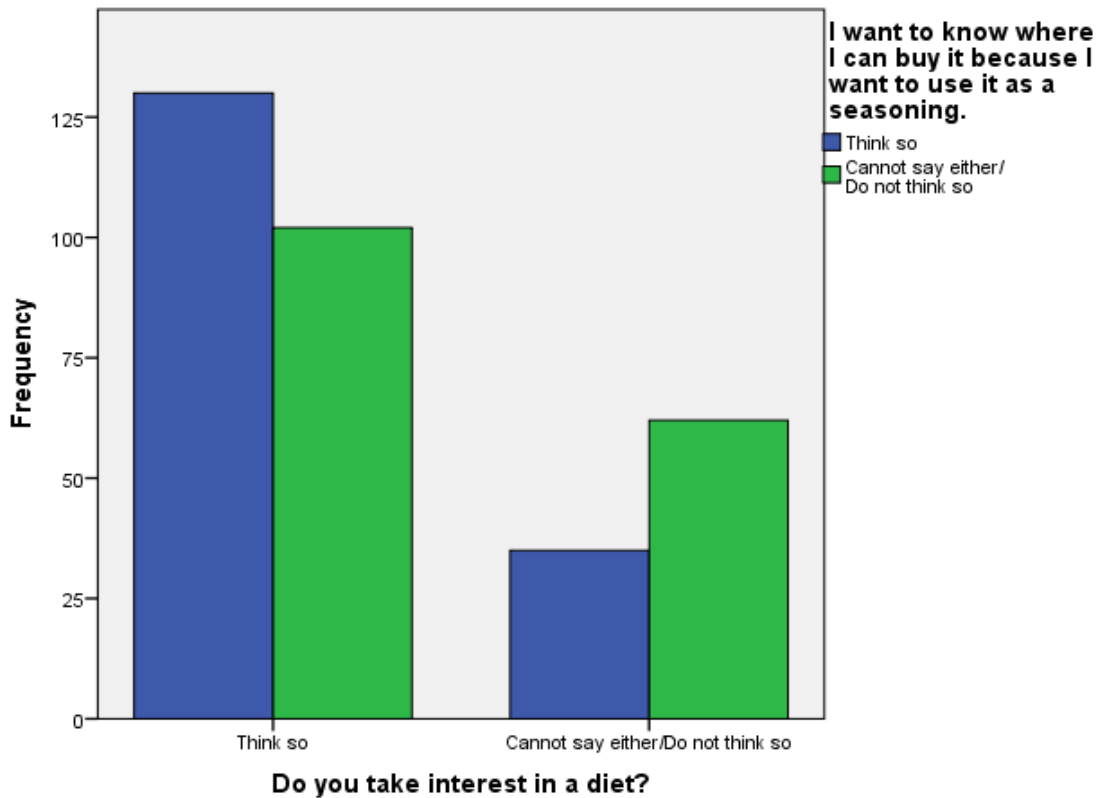


Figure 1. Summary for Null Hypothesis A-1)

The null hypothesis is rejected with 1% significance level. It can be said that those who want to know where he/she can buy it because he/she wants to use it as a seasoning have interest in a diet.

Null Hypothesis A-2): There is not so much difference whether those who want to use it in the cooking are careful of his/her health or not.

Summary table concerning Null Hypothesis A-2) is exhibited in Table 2.

Table 2. Summary table for Null Hypothesis A-2)

Are you careful for the health?		I want to know where I can buy it because I want to use it as a seasoning.		Total
		Think so	Cannot say either/Do not think so	
Think so	Frequency	100	69	169
	%	59.2	40.8	100.0
Cannot say either/Do not think so	Frequency	64	95	159
	%	40.3	59.7	100.0
Total	Frequency	164	164	328
	%	50.0	50.0	100.0

significance probability 0.001

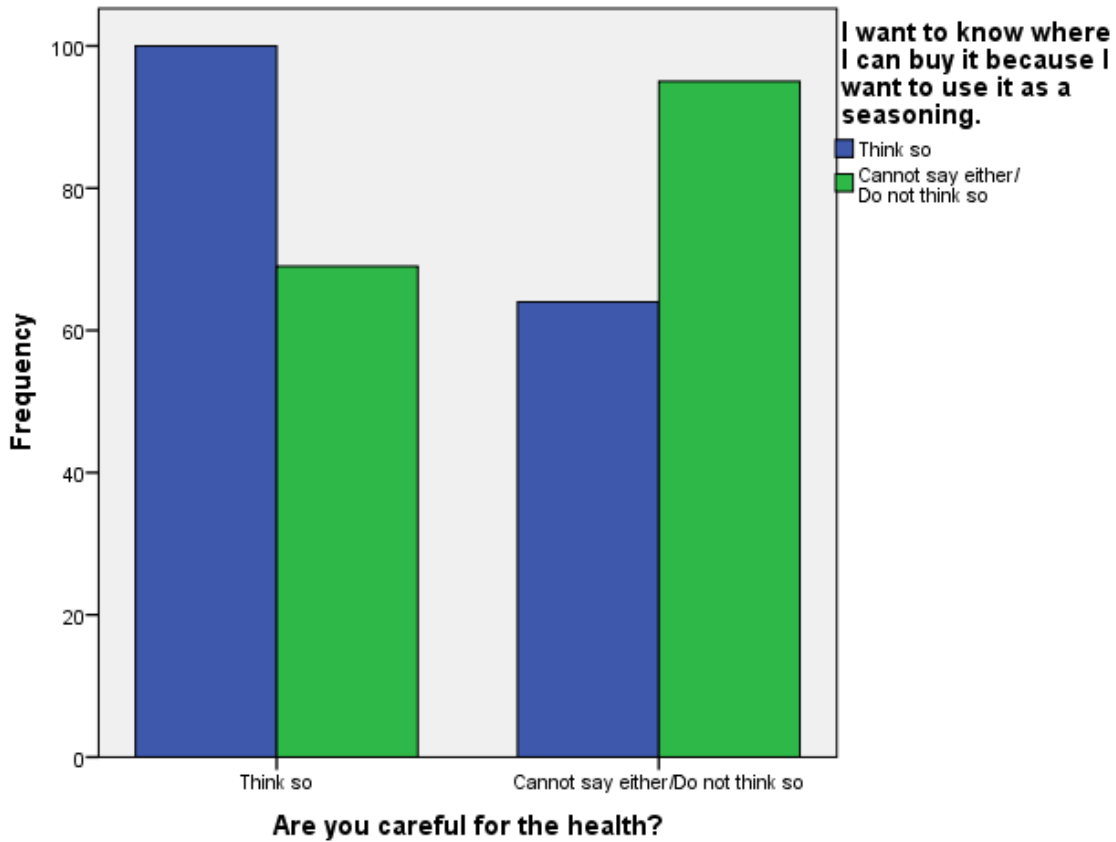


Figure 2. Summary for Null Hypothesis A-2)

The null hypothesis is rejected with 1% significance level. It can be said that those who want to know where he/she can buy it because he/she wants to use it as a seasoning are careful of his/her health.

Null Hypothesis A-3): There is not so much difference whether those who want to know where he/she can buy it because he/she wants to use it as a seasoning have interest in the designated health food or not.

Summary table concerning Null Hypothesis A-3) is exhibited in Table 3.

Table 3. Summary table for Null Hypothesis A-3)

Do you take interest in the designated health food?		I want to know where I can buy it because I want to use it as a seasoning.		
		Think so	Cannot say either/Do not think so	Total
Think so	Frequency	86	69	155
	%	55.5	44.5	100.0
Cannot say either/Do not think so	Frequency	78	95	173
	%	45.1	54.9	100.0
Total	Frequency	164	164	328
	%	50.0	50.0	100.0

significance probability 0.060

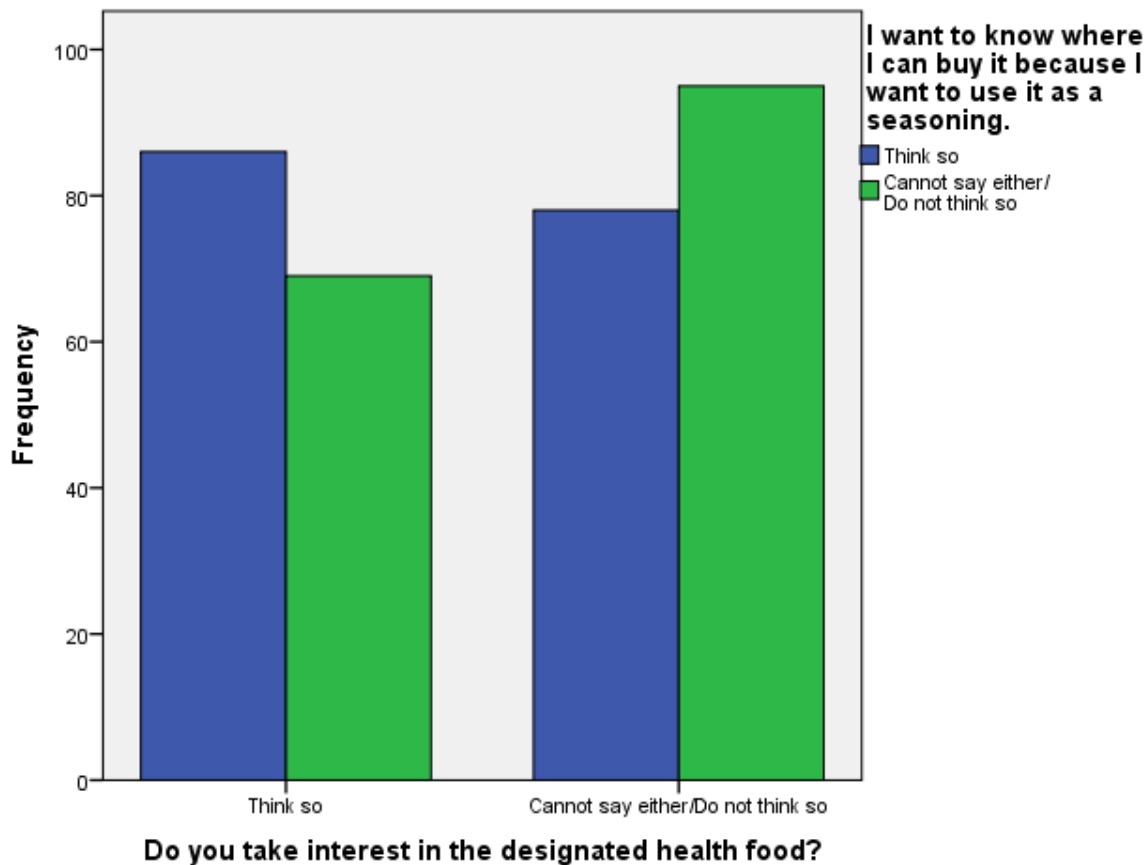


Figure 3. Summary for Null Hypothesis A-3)

The null hypothesis is not rejected. It can be said that there is not so much difference whether those who want to know where he/she can buy it because he/she wants to use it as a seasoning have interest in the designated health food or not.

Null Hypothesis A-4): There is not so much difference whether those who want to know where he/she can get information because he/she wants to use it as a supplement have interest in a diet or not.

Summary table concerning Null Hypothesis A-4) is exhibited in Table 4.

Table 4. Summary table for Null Hypothesis A-4)

Do you take interest in a diet?		I want to know where I can get information because I want to use it as a supplement.		
		Think so	Cannot say either/Do not think so	Total
Think so	Frequency	163	69	232
	%	70.3	29.7	100.0
Cannot say either/Do not think so	Frequency	52	45	97
	%	53.6	46.4	100.0
Total	Frequency	215	114	329
	%	65.3	34.7	100.0

significance probability 0.004

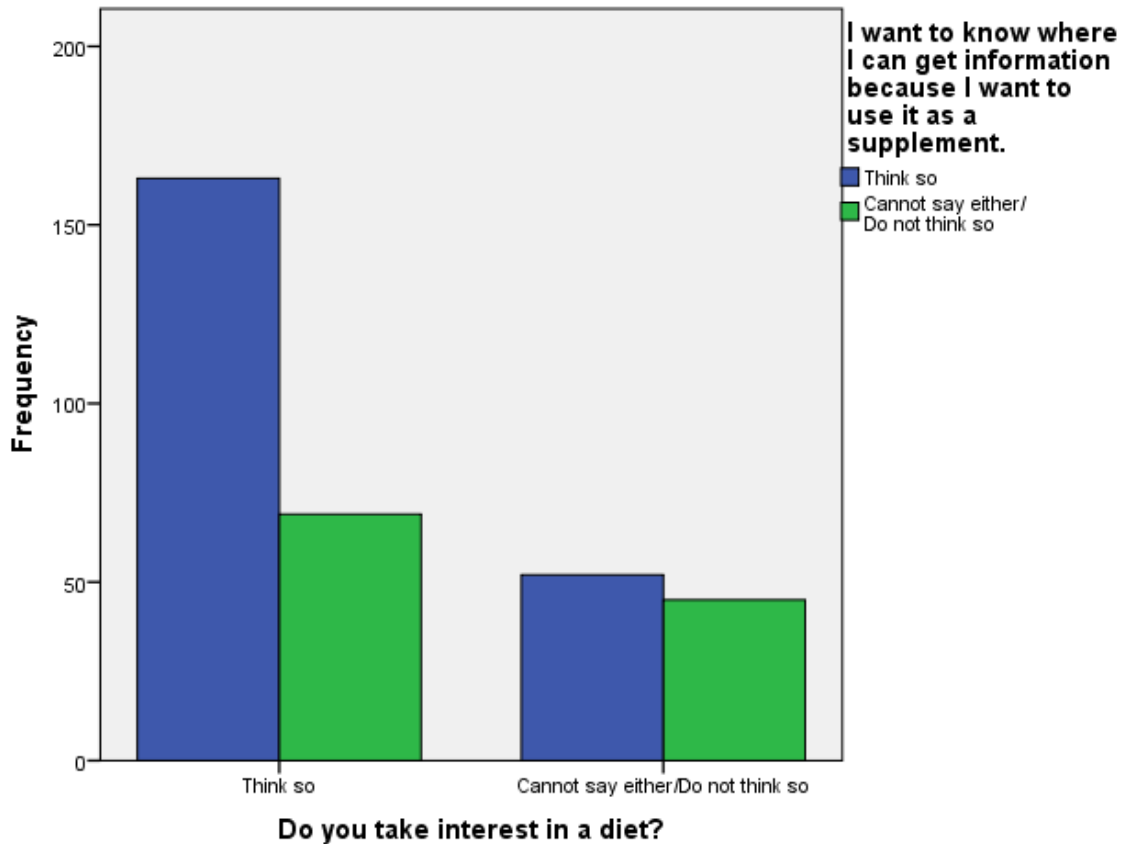


Figure 4. Summary for Null Hypothesis A-4)

The null hypothesis is rejected with 1% significance level. It can be said that those who want to know where he/she can get information because he/she wants to use it as a supplement have interest in a diet.

Null Hypothesis A-5): There is not so much difference whether those who want to know where he/she can get information because he/she wants to use it as a supplement are careful of his/her health or not.

Summary table concerning Null Hypothesis A-5) is exhibited in Table 5.

Table 5. Summary table for Null Hypothesis A-5)

Are you careful for the health?		I want to know where I can get information because I want to use it as a supplement.		
		Think so	Cannot say either/Do not think so	Total
Think so	Frequency	126	44	170
	%	74.1	25.9	100.0
Cannot say either/Do not think so	Frequency	88	70	158
	%	55.7	44.3	100.0
Total	Frequency	214	114	328
	%	65.2	34.8	100.0

significance probability 0.000

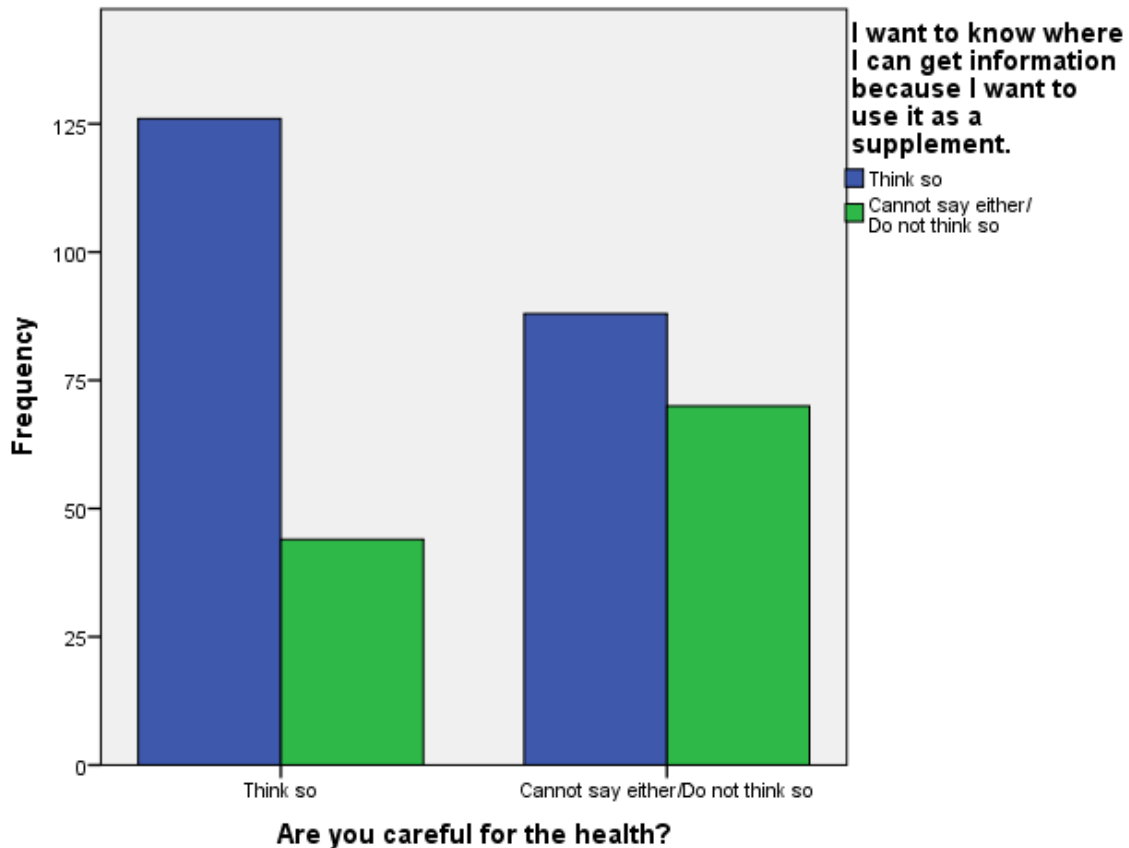


Figure 5. Summary for Null Hypothesis A-5)

The null hypothesis is rejected with 1% significance level. It can be said that those who want to know where he/she can get information because he/she wants to use it as a supplement are careful of his/her health.

Null Hypothesis A-6): There is not so much difference whether those who want to know where he/she can get information because he/she wants to use it as a supplement have interest in the designated health food or not.

Summary table concerning Null Hypothesis A-6) is exhibited in Table 6.

Table 6. Summary table for Null Hypothesis A-6)

Do you take interest in the designated health food?		I want to know where I can get information because I want to use it as a supplement.		Total
		Think so	Cannot say either/Do not think so	
Think so	Frequency	117	37	154
	%	76.0	24.0	100.0
Cannot say either/Do not think so	Frequency	97	77	174
	%	55.7	44.3	100.0
Total	Frequency	214	114	328
	%	65.2	34.8	100.0

significance probability 0.000

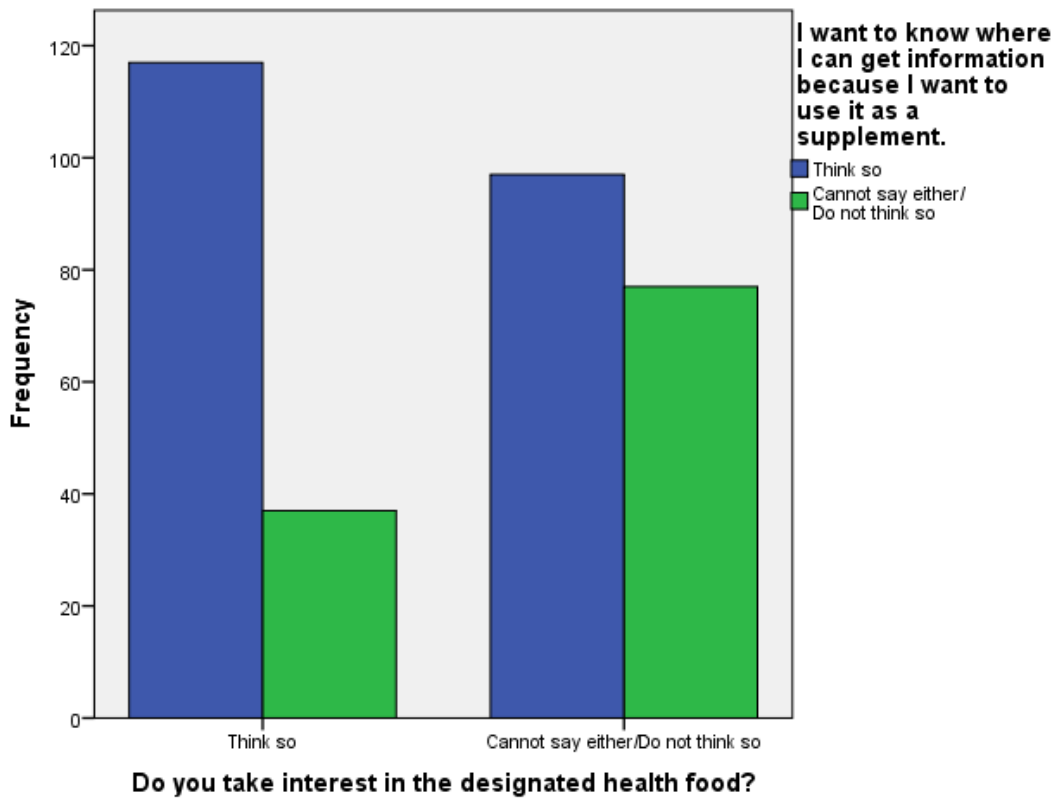


Figure 6. Summary for Null Hypothesis A-6)

The null hypothesis is rejected with 1% significance level. It can be said that those who want to know where he/she can get information because he/she wants to use it as a supplement have interest in the designated health food.

Null Hypothesis A-7): There is not so much difference whether those who want to know the hospital where the Rare Sugar is used as a tool for treatment have interest in a diet or not.

Summary table concerning Null Hypothesis A-7) is exhibited in Table 7.

Table 7. Summary table for Null Hypothesis A-7)

Do you take interest in a diet?		I want to know the hospital where the Rare Sugar is used as a tool for treatment.		
		Think so	Cannot say either/Do not think so	Total
Think so	Frequency	132	101	233
	%	56.7	43.3	100.0
Cannot say either/Do not think so	Frequency	40	57	97
	%	41.2	58.8	100.0
Total	Frequency	172	158	330
	%	52.1	47.9	100.0

significance probability 0.011

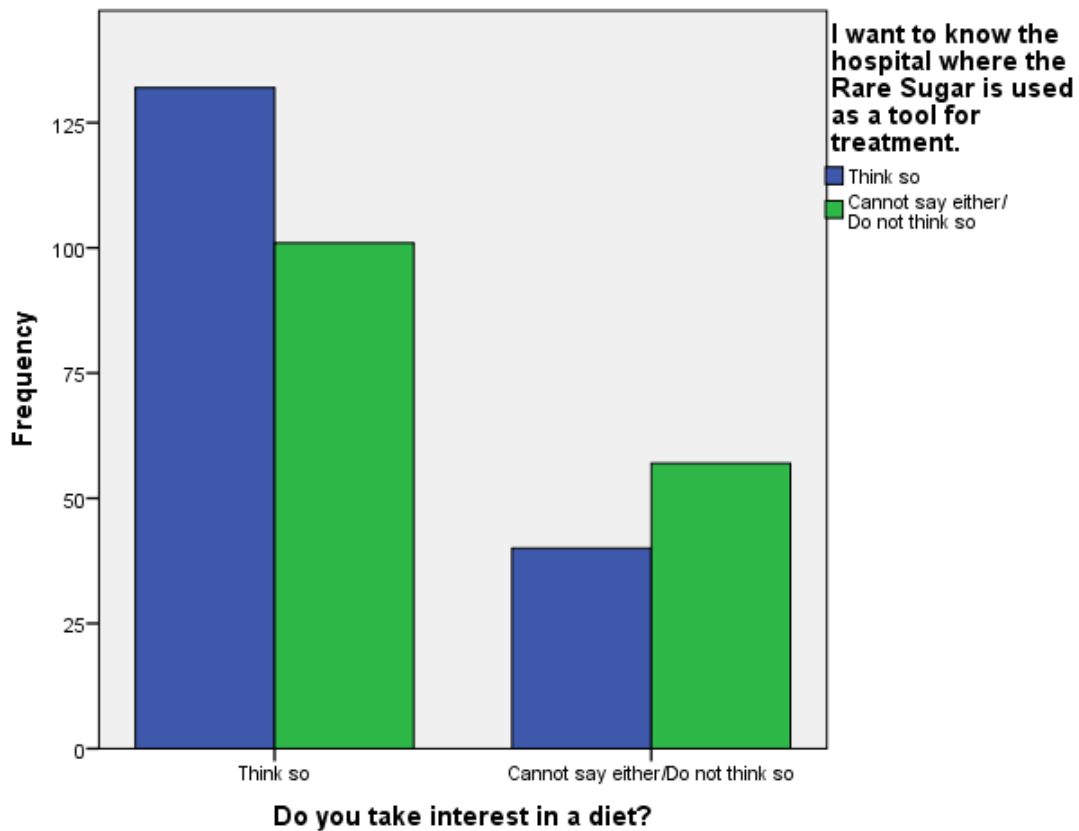


Figure 7. Summary for Null Hypothesis A-7)

The null hypothesis is rejected with 5% significance level. It can be said that those who want to know the hospital where the Rare Sugar is used as a tool for treatment have interest in a diet.

Null Hypothesis A-8): There is not so much difference whether those who want to know the hospital where the Rare Sugar is used as a tool for treatment are careful of his/her health or not.

Summary table concerning Null Hypothesis A-8) is exhibited in Table 8.

Table 8. Summary table for Null Hypothesis A-8)

Are you careful for the health?		I want to know the hospital where the Rare Sugar is used as a tool for treatment.		
		Think so	Cannot say either/Do not think so	Total
Think so	Frequency	101	69	170
	%	59.4	40.6	100.0
Cannot say either/Do not think so	Frequency	70	89	159
	%	44.0	56.0	100.0
Total	Frequency	171	158	329
	%	52.0	48.0	100.0

significance probability 0.005

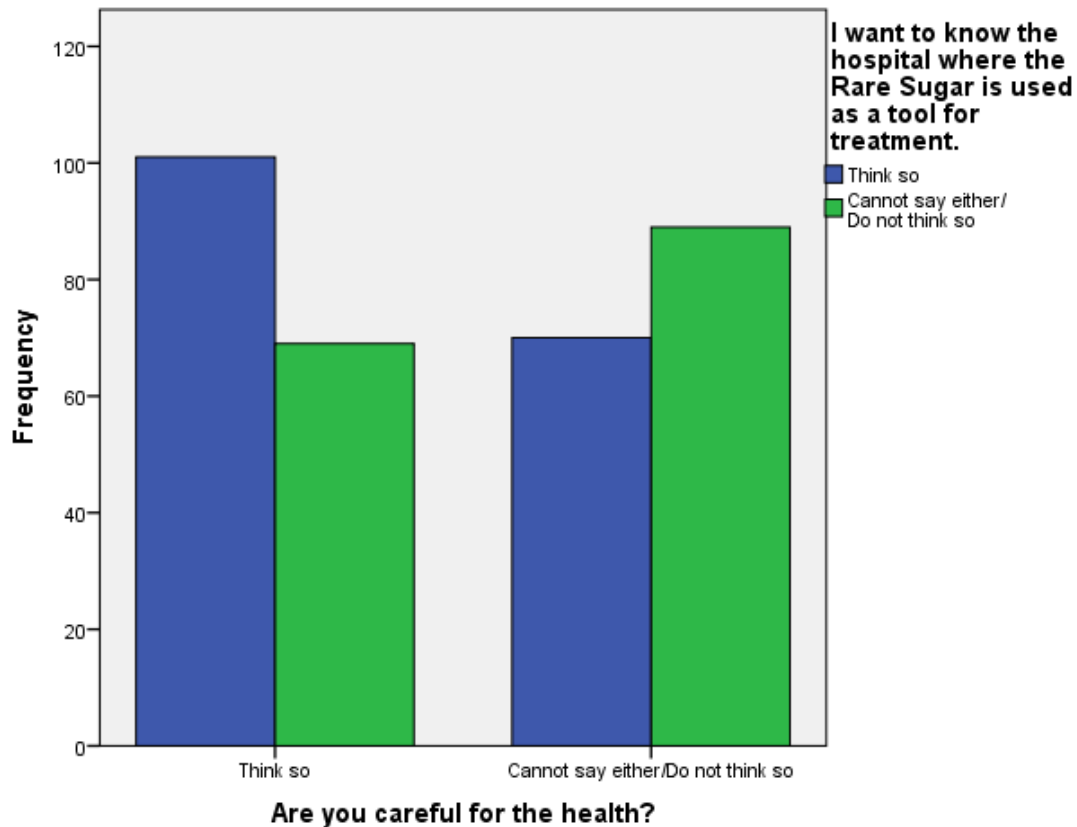


Figure 8. Summary for Null Hypothesis A-8)

The null hypothesis is rejected with 1% significance level. It can be said that those who want to know the hospital where the Rare Sugar is used as a tool for treatment are careful of his/her health.

Null Hypothesis A-9): There is not so much difference whether those who want to know the hospital where the Rare Sugar is used as a tool for treatment have interest in the designated health food or not.

Summary table concerning Null Hypothesis A-9) is exhibited in Table 9.

Table 9. Summary table for Null Hypothesis A-9)

Do you take interest in the designated health food?		I want to know the hospital where the Rare Sugar is used as a tool for treatment.		
		Think so	Cannot say either/Do not think so	Total
Think so	Frequency	92	63	155
	%	59.4	40.6	100.0
Cannot say either/Do not think so	Frequency	80	94	174
	%	46.0	54.0	100.0
Total	Frequency	172	157	329
	%	52.3	47.7	100.0

significance probability 0.015

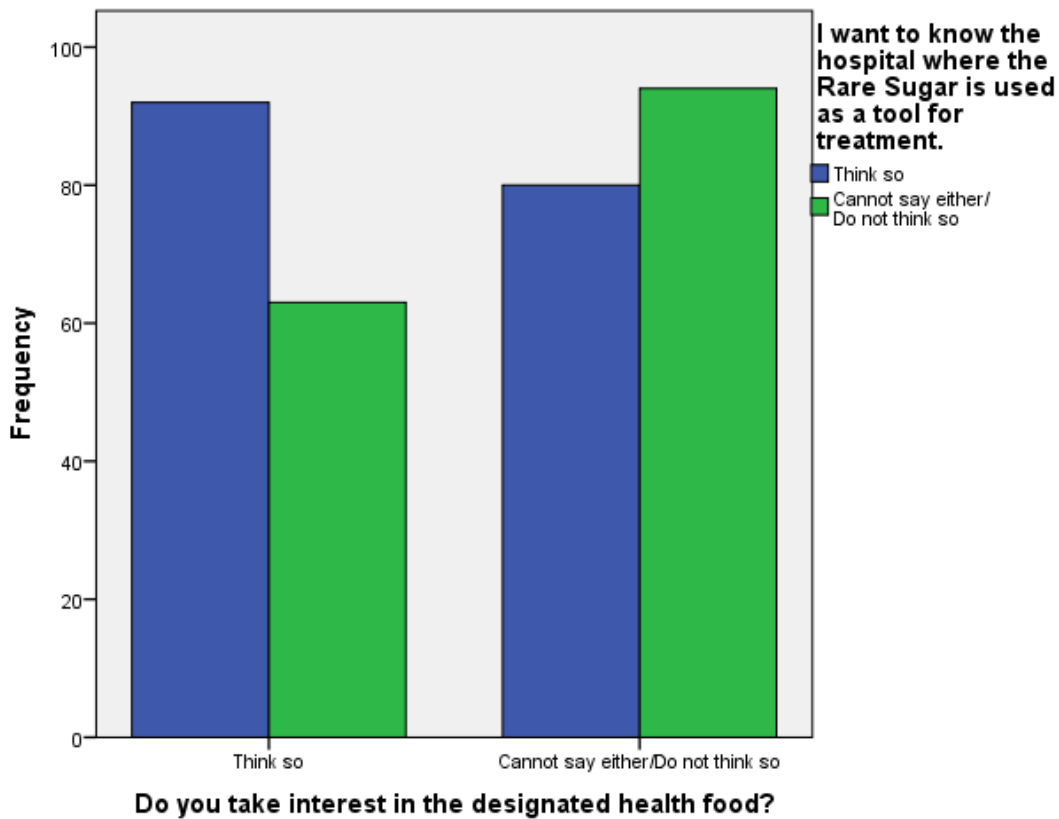


Figure 9. Summary for Null Hypothesis A-9)

The null hypothesis is rejected with 5% significance level. It can be said that those who want to know the hospital where the Rare Sugar is used as a tool for treatment have interest in the designated health food.

4. Remarks

The results for Hypothesis Testing are as follows. 8 cases out of 9 are rejected (A-1, A-2, A-4, A-5, A-6, A-7, A-8, A-9). It can be said that the majority of issues are insisted clearly.

5. Conclusion

The Rare Sugars exist naturally and have many kinds (more than 50). They have good effect for health such as prevention of increasing the blood-sugar level after eating, suppression of fat accumulation, suppression of increasing the blood pressure, and anti-oxidative effect etc. It is in the spotlight for many people especially for those who are in the metabolic syndrome. The Rare Sugars are prevailing now in Japan. It is utilized in cooking, drinks and cakes etc. The big food companies are putting it into their products and make promotions by TV and other media. There are few related papers concerning the marketing research and its utilization of this matter. In this paper, a questionnaire investigation was executed to the student of Kagawa Junior College in order to clarify consumers' current condition and their consciousness, and to seek the possibility of utilizing the Rare Sugars. Hypothesis Testing analysis was conducted based on that. We have set nine issues as follows.

- A-1) Those who want to know where he/she can buy it because he/she wants to use it as a seasoning have interest in a diet.
- A-2) Those who want to know where he/she can buy it because he/she wants to use it as a seasoning are careful of his/her health.
- A-3) Those who want to know where he/she can buy it because he/she wants to use it as a seasoning have interest in the designated health food.

- A-4)** Those who want to know where he/she can get information because he/she wants to use it as a supplement have interest in a diet.
- A-5)** Those who want to know where he/she can get information because he/she wants to use it as a supplement are careful of his/her health.
- A-6)** Those who want to know where he/she can get information because he/she wants to use it as a supplement have interest in the designated health food.
- A-7)** Those who want to know the hospital where the Rare Sugar is used as a tool for treatment have interest in a diet.
- A-8)** Those who want to know the hospital where the Rare Sugar is used as a tool for treatment are careful of his/her health.
- A-9)** Those who want to know the hospital where the Rare Sugar is used as a tool for treatment have interest in the designated health food.

The results for Hypothesis Testing analysis are as follows. 8 cases out of 9 are rejected (**A-1, A-2, A-4, A-5, A-6, A-7, A-8, A-9**). It can be said that the majority of issues are insisted clearly.

Further study on this should be executed such as multivariate analysis. Various cases should be investigated here after.

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References

- Hayashi, N., Iida, T., Yamada, T., Okuma, K., Takehara, I., Yamamoto, T., ... Tokuda, M. (2010). Study on the postprandial blood glucose suppression effect of D-psicose in borderline diabetes and the safety of long-term ingestion by normal human subjects. *Biosci Biotechnol Biochem.* 74(3),510-9. <https://doi.org/10.1271/bbb.90707>
- Hirata, Y., Saito, M., Tsukamoto, I., Yamaguchi, F., Sui, L., Kamitori, K., ... Tokuda, M. (2009, May). Analysis of the inhibitory mechanism of D-allose on MOLT-4F leukemia cell proliferation. *J. Biosci Bioeng.*, 107(5), 562-8. <https://doi.org/10.1016/j.jbiosc.2008.12.021>
- Hossain, M.A., Kitagaki, S., Nakano, D., Nishiyama, A., Funamoto, Y., Matsunaga, T., ... Tokuda, M. (2011, Feb. 4). Rare sugar D-psicose improves insulin sensitivity and glucose tolerance in type 2 diabetes Otsuka Long-Evans Tokushima Fatty (OLETF) rats. *Biochem Biophys Res Commun*, 405(1), 7-12. <https://doi.org/10.1016/j.bbrc.2010.12.091>
- Iida, T., Hayashi, N., Yamada, T., Yoshikawa, Y., Miyazato, S., Kishimoto, Y., ... Izumori K. (2010). Failure of d-psicose absorbed in the small intestine to metabolize into energy and its low large intestinal fermentability in humans. *Metabolism*, 59(2), 206-14. <https://doi.org/10.1016/j.metabol.2009.07.018>
- Kajikawa, T., Tada, S., Kitanaka, A., Tokuda, M., Taminat, T., & Analy, J. (2010). Reactivity of rare sugar D-allose during glycation of human serum albumin. *Bio-Sci.*, 33(3), 227-236.
- Yamada, K., Noguchi, C., Kamitori, K., Dong, Y., Hirata, Y., Hossain, M.A., ... Yamaguchi, F. (2012, Feb.). Rare sugar d-allose strongly induces thioredoxin-interacting protein and inhibits osteoclast differentiation in Raw264 cells. *Nutr Res*, 32(2), 116-23. <https://doi.org/10.1016/j.nutres.2011.12.010>

Appendix. Questionnaire about the Rare Sugars

◆Questionnaire about the Rare Sugars◆

2015/6/15

The Rare Sugars exist naturally and have many kinds (morethan 50). They have good effect for health such as prevention of increasing the a blood - sugar level after eating, suppression of fat accumulation, suppression of increasing the blood pressure, and antioxidative effect etc. It is in the spotlight for many people especially for those who are in the metabolic syndrome.

Please select the appropriate item in each column.(Plural answers are allowed for Q2, 9, 24, 28. Select ①~⑤ in the right colum for Q7, 8, 10-23, 25-27.)

1.We ask you about the Rare Sugars.						
1-1. Do you know the Rare Sugars?						
Q1	①Know ②Do not know (⇒ Proceed to Q8 who has selected ② and answer until to the last.)					
1-2. We ask you who have selected ①. Where did you know the Rare Sugar?【Plural answers are allowed】						
Q2	①TV ②Magazine ③Newspaper ④Shop ⑤Vending Machine ⑥Seminar ⑦Internet ⑧Hear from another person ⑨Miscellaneous ()					
1-3. Do you know that the Rare Sugar has effect on obese prevention and/or diabetes prevention etc.?						
Q3	①Know ②Do not know					
1-4. Have you heard or used the syrup which includes Rare Sugar "Rare Sugar Sweet"?						
Q4	①Heard ②Not heard					
Q5	①Used ②Not used					
1-5. Have you drunk or eaten the food which includes the Rare Sugar?						
Q6	①Yes ②No					
Q7	1-6. We ask you who have selected ① in Q6. Was the Rare Sugar effective after using it for more than one month? (⇒Proceed to Q9)	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q8	1-7. We ask you who have selected ② in Q1,② in Q6. Do you want to try to eat or drink the food in which the Rare Sugar is included?	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
1-8. What kind of food do you want to eat if the Rare Sugar is included?【Plural answers are allowed】						
Q9	①Cake ②Juice ③Japanese food ④Western food ⑤Chinese food ⑥Miscellaneous ()					
1-9.How do you want to use the Rare Sugar?						
Q10	a. I want to use it in the cooking.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q11	b. I can easily use it if there is a recipe.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q12	c. I want to know where I can buy it because I want to use it as a seasoning.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q13	d. I want to know where I can get information because I want to use it as a supplement.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q14	e. I want to know the hospital where the Rare Sugar is used as a tool for treatment.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q15	f. I want to know how long I should use it in order to confirm the effectiveness.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
1-10.Do you have a question(doubt) or anxiety for the Rare Sugar?						
Q16	a. It is not so popular.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q17	b. It seems to be expensive.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q18	c. I cannot grasp the concrete effect.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q19	d. I cannot have confidence that it is safe for anybody.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q20	e. Surrounding people do not use it so often.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q21	f. I cannot find the food in the shop in which the Rare Sugar is included.	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q22	g. I cannot guess how I should use the Rare Sugar to what kind of cooking?	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q23	h. Miscellaneous ()	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
1-11.Choose the drink that you are interested in.【Plural answers are allowed】						
Q24	①aojiru ②OS-1(oral rehydration solution)Drink for sports ④designated health drink ⑤drink with the Rare Sugar ⑥None ⑦Miscellaneous ()					
Q25	1-12. Do you take interest in a diet?	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q26	1-13. Are you careful for the health?	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
Q27	1-14. Do you take interest in the designated health food?	①Think it very much	②Slightly think so	③Cannot say either	④Slightly do not think so	⑤Do not think so
1-15. Which method would be suitable for the Rare Sugar to become popular?						
Q28	①TV CM ②Use Twitter,Facebook ③Advertisement by the company ④Spread the way of cooking ⑤Sell candy with the Rare Sugar ⑥Sell juice with the Rare Sugar ⑦Restaurant at which the Rare Sugar is used in the cooking ⑧Use it in the food at the hospital ⑨Sell it as a supplement ⑩Make promotion by utilizing famous sportsmen or entertainers ⑪Miscellaneous ()					
2.What is your hobby? (Select only one in the right hand column)						
Q29	2-1.Playing Sports: ①Baseball ②Football ③Tennis ④Golf ⑤Miscellaneous ()	①Like it very much	②Slightly like it	③Ordinary level		
Q30	2-2. Watching Sports: ①Baseball ②Football ③Tennis ④Golf ⑤Miscellaneous ()	①Like it very much	②Slightly like it	③Ordinary level		
Q31	2-3. Drinking: ①Beer ②Wine ③Japanese wine-sake ④Japanese liquor-shochu ⑤Whisky ⑥Miscellaneous ()	①Like it very much	②Slightly like it	③Ordinary level		

3. We ask you questions about your current condition.	
Q32	3-1. Sex: ①Male ②Female
Q33	3-2. Age: ①~19 ②20~29 ③30~39 ④40~49 ⑤50~59 ⑥More than 60
Q34	3-3. Occupation: ①Student ②Officer ③Company Employee ④Clerk of Organization ⑤Independents ⑥Part-timer ⑦Housewife ⑧Miscellaneous()
Q35	3-4. Address: ①Prefecture() ②City()
Q36	3-5. What kind of lifestyle do you like?: ①Outdoor ②Indoor ③Not either