

Multivariate Analysis by Using Quantification Method II on a Questionnaire Investigation for 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. There are few related papers concerning the marketing research and its utilization of this matter. In this paper, a questionnaire investigation is executed in order to clarify consumers' current condition and their consciousness, and to seek the possibility of utilizing the Rare Sugars. Fundamental statistical analysis, Multivariate Analysis by Using Quantification Method II are conducted based on that. Some interesting and instructive results were obtained.

Keywords: the rare sugars, consumer, multivariate analysis, quantification method II

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 are good for the health and are sold in the market as a sweetening, seasoning or functional ingredient for food.

In this paper, a questionnaire investigation is executed in order to clarify the recognition level among consumers and to pursue the future possibility of the Rare Sugars. Such multivariate analysis as Quantification Method II is conducted.

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, Multivariate Analysis by Using Quantification Method II 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 : April – June 2015
 (3) Method : Leave until called for
 (4) Collection : Number of distribution 186
 Number of collection 186 (collection rate 100.0%)
 Valid answer 186

2.2 Basic Statistical Results

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

(1) Basic characteristics of answers

Q32. Sex

	Frequency	%
Male	19	11
Female	154	89
Total	173	100

Q33. Age

	Frequency	%
-19	139	80.3
20-19	33	19.1
30-19	0	0
40-49	0	0
50-59	1	1
60-	0	0
Total	173	100

Q34. Occupation

	Frequency	%
Student	171	98.8
Officer	0	0
Company Employee	0	0
Clerk of Organization	0	0
Independents	0	0
Part timer	0	0
Housewife	1	0.6
Not Filled in	1	0.6
Total	173	100

Q25. Do you take interest in a diet?

	Frequency	%
Think it very much	65	38.0
Slightly think so	52	30.4
Cannot say either	24	14.0
Slightly do not think so	15	8.8
Do not think so	15	8.8
Total	171	100

Q26. Are you careful for the health?

	Frequency	%
Think it very much	21	12.2
Slightly think so	64	37.4
Cannot say either	65	38.0
Slightly do not think so	15	8.8
Do not think so	6	3.5
Total	171	100

As is shown in the above-mentioned table, female students take the majority, therefore 70% of them have interest in diet and nearly half of them are careful for the health.

(2) Summary result for the main items

A. Q1 Do you know the Rare Sugars?

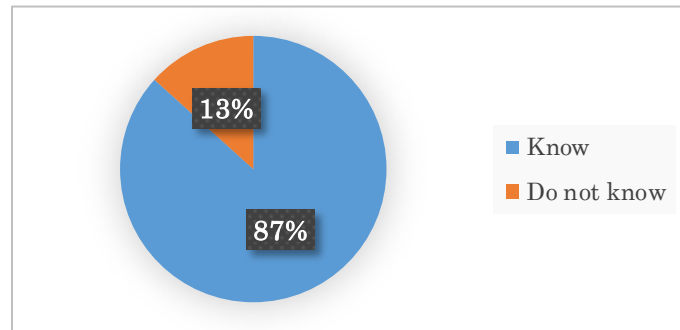


Figure 2.1. Q1 Do you know the Rare Sugars?

Nearly 90% of them knew the Rare Sugars.

B. Q6 Have you drunk or eaten the food in which the Rare Sugars are included?

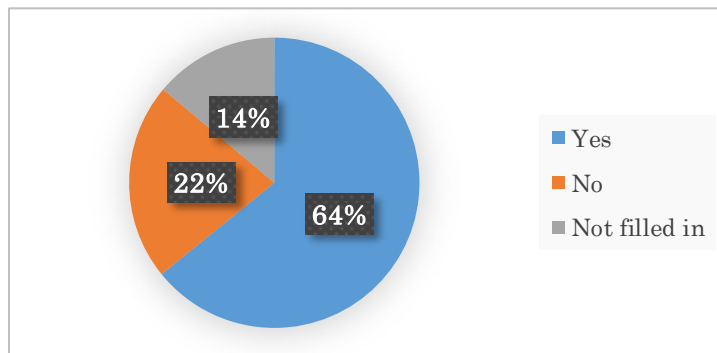


Figure 2.2. Q6 Have you drunk or eaten the food in which the Rare Sugars are included?

Nearly 2/3 of them answered that they have experienced the Rare Sugars.

C. Q7 Was the Rare Sugar effective after using it for more than one month?

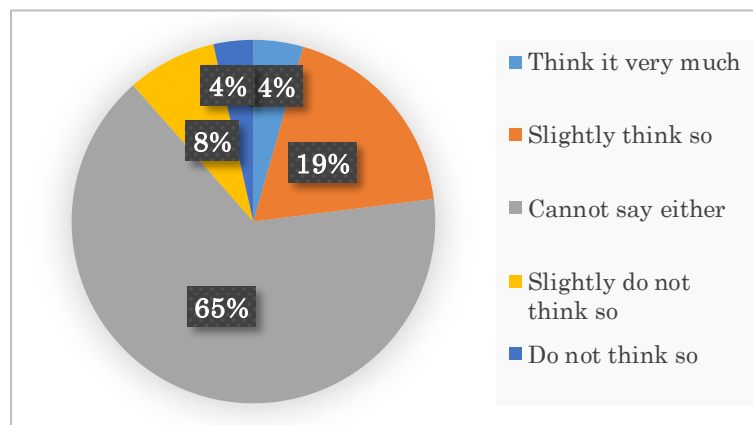


Figure 2.3. Q7 Was the Rare Sugar effective after using it for more than one month?

23% answered that the Rare Sugar was effective after using it for more than one month. On the contrary, 12 % said that it was not effective. While 2/3 have chosen “cannot say either”. They cannot grasp the distinct effect in the short time usage.

D. Q8 Do you want to try to eat or drink the food in which the Rare Sugar is included?

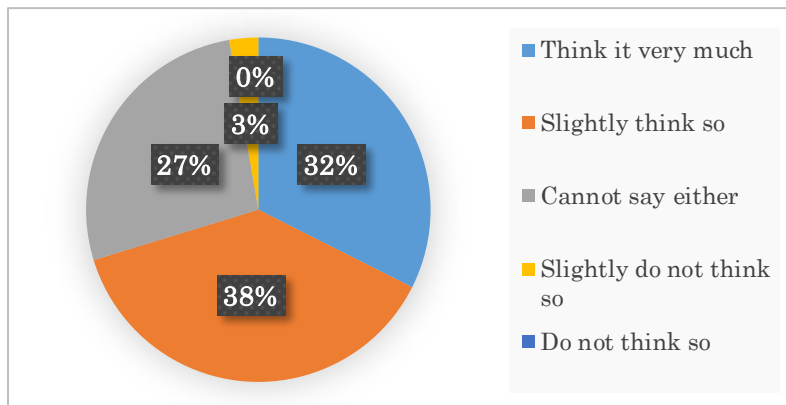


Figure 2.4. Q8 Do you want to try to eat or drink the food in which the Rare Sugar is included? Nearly 70% of them answered that they want to eat or drink the food in which the Rare Sugar is included.

E. Q10-15 How do you want to use the Rare Sugar?

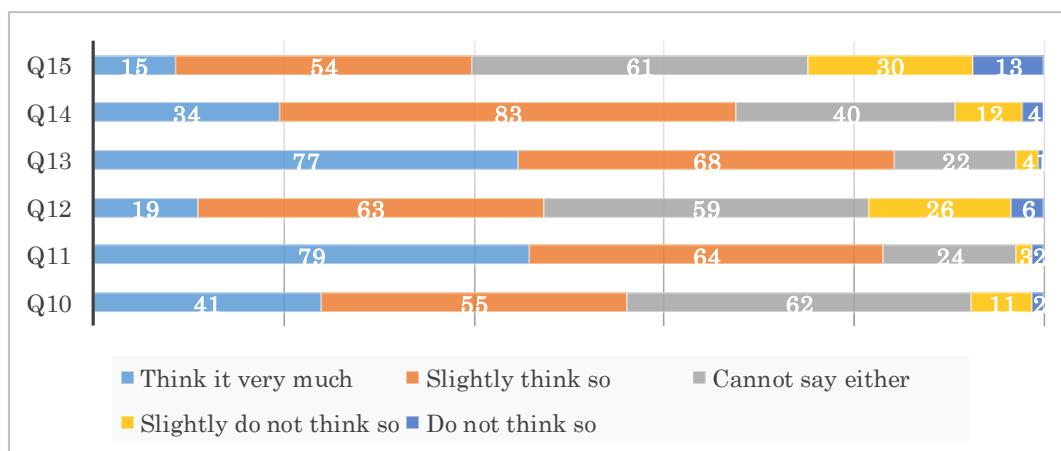


Figure 2.5. How do you want to use the Rare Sugar?

Consumers want to use the Rare Sugar in various aspects such as “as a supplement”, “can easily use it with a recipe”, “as a tool for treatment” and “in the cooking”.

F. Q16-22 Anxiety in using the Rare Sugar

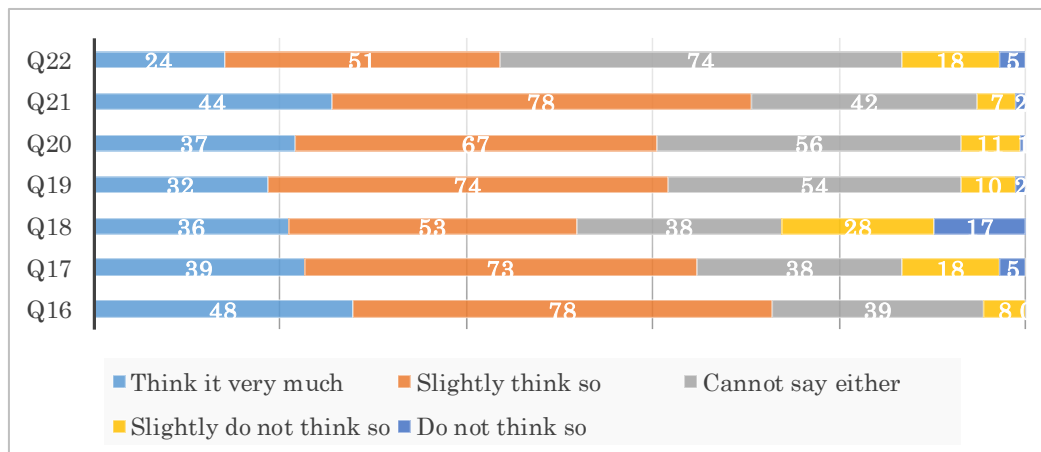


Figure 2.6. Q16-22 Anxiety in using the Rare Sugar

They feel anxiety in using the Rare Sugar because “Not so popular”, “Cannot find food in the shop”, “Seems to be expensive”, “Cannot have confidence that it is safe for anybody” and “Surrounding people do not use it so often”. These imply that the suppliers should dispatch much more information which removes the anxiety consumers hold.

3. Multivariate Analysis by Using Quantification Method II

Multivariate Analysis by Using Quantification Method II is conducted on the following six points.

- A. Q7:Q10-15
- B. Q8:Q10-15
- C. Q25:Q10-15
- D. Q25:Q16-22
- E. Q26:Q10-15
- F. Q26:Q16-22

3.1 Q7. Q10-15

Discrimination analysis by Quantification Method II is executed. Outer criterion is set Q7 “Was the Rare Sugar effective?”. Explanation variables are set for Q10-15 “How do you want to use the Rare Sugar?”.

Eigenvalue is exhibited in Table 3.1 and Wilks’ Lambda is exhibited in Table 3.2.

Table 3.1. Eigenvalue

Function	Eigenvalue	Variance (%)	Accumulation (%)	Canonical Correlation
1	.194 ^a	100.0	100.0	.403

Table 3.2. Wilks’ Lambda

Test	Wilks’ Lambda	χ^2	Degree of Freedom	Significance probability
1	.838	17.894	6	.007

From Table 3.1, canonical correlation coefficient is 0.403 and it is not so high. But from Table 3.2, Wilks’ Lambda is 0.838 and is 0.007 in Significance probability therefore it is statistically significant by 5 % significance level. Coefficient of standardized canonical discrimination function is exhibited in Table 3.3 and its graph is exhibited in Figure 3.1.

Table 3.3. Coefficient of standardized canonical discrimination function

Function	
1	
Q10	.948
Q11	-.072
Q12	.366
Q13	-.330
Q14	-.185
Q15	.277

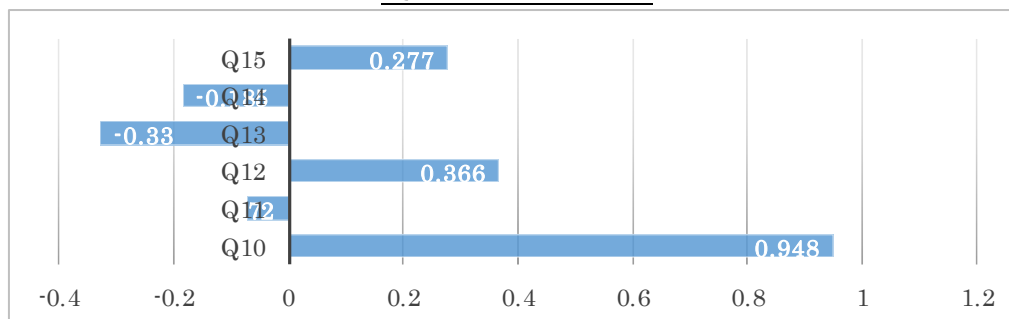


Figure 3.1. Chart of the Coefficient of standardized canonical discrimination function

From Table 3.3 and Figure 3.1, the biggest factor of contribution statistics concerning the effect of the Rare Sugar is Q10”Want to use it in cooking” and the next one is Q12” Want to use it as a seasoning”, which means “How to use it as a food”.

In Table 3.4, non-standardized coefficient of canonical discrimination function is exhibited. Discrimination function is exhibited in (3.1) based on this.

Table 3.4. Non-standardized coefficient of canonical discrimination function

Function	
1	
Q10	2.087
Q11	-.210
Q12	.731
Q13	-1.032
Q14	-.393
Q15	.570
(Constant)	-2.972

$$Z = -2.972 + 2.087Q10 - 0.210Q11 + 0.731Q12 - 1.032Q13 - 0.393Q14 + 0.570Q15 \quad (3.1)$$

In this case, Discrimination hitting ratio is 66.0% and nearly 2/3 is discriminated properly.

3.2 Q8: Q10-15 Eat or Drink the Food in Which the Rare Sugar is Included

Discrimination analysis by Quantification Method II is executed. Outer criterion is set Q8 " Want to eat or drink the food in which the Rare Sugar is included" . Explanation variables are set for Q10-15 " How do you want to use the Rare Sugar?" .

Eigenvalue is exhibited in Table 3.5 and Wilks' Lambda is exhibited in Table 3.6.

Table 3.5. Eigenvalue

Function	Eigenvalue	Variance (%)	Accumulation (%)	Canonical Correlation
1	.608 ^a	100.0	100.0	.615

Table 3.6. Wilks' Lambda

Test	Wilks' Lambda	χ^2	Degree of Freedom	Significance probability
1	.622	31.842	6	.000

From Table 3.5, canonical correlation coefficient is 0.615 and it is slightly high. But from Table 3.6, Wilks' Lambda is 0.622 and is 0.000 in Significance probability therefore it is statistically significant by 5 % significance level. Coefficient of standardized canonical discrimination function is exhibited in Table 3.7 and its graph is exhibited in Figure 3.2.

Table 3.7. Coefficient of standardized canonical discrimination function

Function	
1	
Q10	.758
Q11	.504
Q12	.040
Q13	.020
Q14	-.023
Q15	-.207

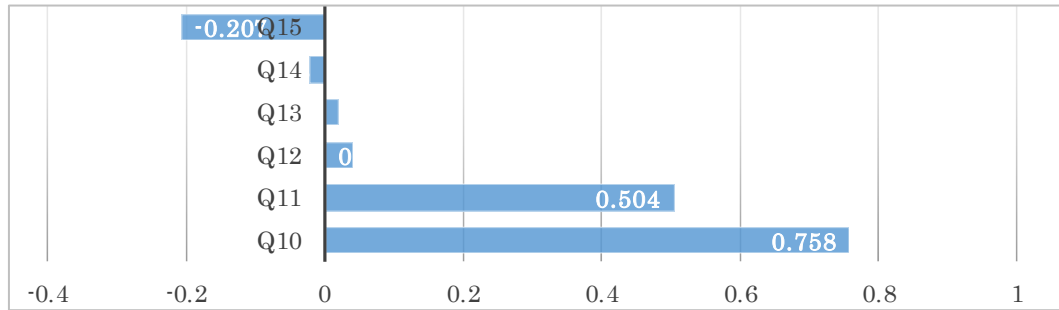


Figure 3.2. Chart of the Coefficient of standardized canonical discrimination function

From Table 3.6 and Figure 3.2, the biggest factor of contribution statistics concerning "Want to eat or drink the food in which the Rare Sugar is included" is Q10 "Want to use it in cooking" and the next one is Q11 "Can easily use it if there is a recipe", which means "Requirement for cooking".

In Table 3.8, non-standardized coefficient of canonical discrimination function is exhibited. Discrimination function is exhibited in (3.2) based on this.

Table 3.8. Non-standardized coefficient of canonical discrimination function

Function	
1	
Q10	1.787
Q11	1.272
Q12	.079
Q13	.051
Q14	-.050
Q15	-.413
(Constant)	-3.821

$$Z = -3.821 + 1.787Q10 + 1.272Q11 + 0.079Q12 + 0.051Q13 - 0.050Q14 - 0.413Q15 \quad (3.2)$$

In this case, Discrimination hitting ratio is 80.6% and it is rather high. More than 80 % is discriminated properly. Thus, contribution of the utilization of the Rare Sugar in cooking is high concerning the desire of eating or drinking food in which the Rare Sugar is included.

3.3 Q25: Q10-15 Interest in a Diet

Discrimination analysis by Quantification Method II is executed. Outer criterion is set Q25 "Do you take interest in a diet?". Explanation variables are set for Q10-15 "How do you want to use the Rare Sugar?".

Eigenvalue is exhibited in Table 3.9 and Wilks' Lambda is exhibited in Table 3.10.

Table 3.9. Eigenvalue

Function	Eigenvalue	Variance (%)	Accumulation (%)	Canonical Correlation
1	.130 ^a	100.0	100.0	.340

Table 3.10. Wilks' Lambda

Test	Wilks' Lambda	χ^2	Degree of Freedom	Significance probability
1	.885	19.854	6	.003

From Table 3.9, canonical correlation coefficient is 0.340 and it is low. But from Table 3.10, Wilks' Lambda is 0.885 and is 0.003 in Significance probability therefore it is statistically significant by 5 % significance level. Coefficient of standardized canonical discrimination function is exhibited in Table 3.11 and its graph is exhibited in Figure 3.3.

Table 3.11. Coefficient of standardized canonical discrimination function

	Function 1
Q10	.532
Q11	-.238
Q12	.331
Q13	.484
Q14	.443
Q15	-.070

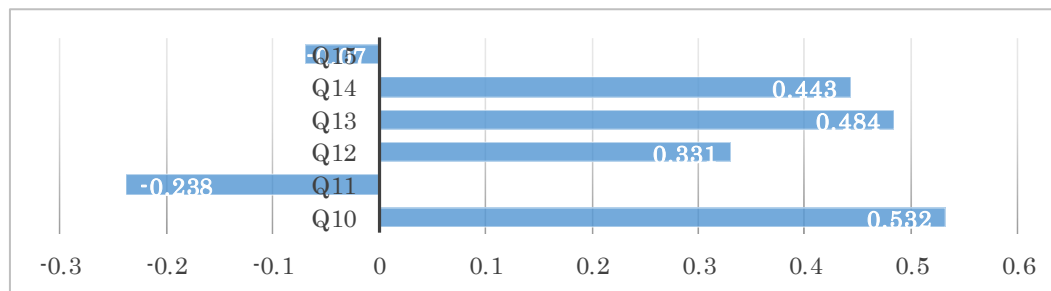


Figure 3.3. Chart of the Coefficient of standardized canonical discrimination function

From Table 3.11 and Figure 3.3, the biggest factor of contribution statistics concerning "Interest in a diet" is Q10 "Want to use it in cooking" and the next one is Q13 "Want to know where I can get information because I want to use it as a supplement", Q14 "Want to know the hospital where the Rare Sugar is used as a tool for treatment" which means that it is a factor concerning eating or drinking, supplement and treatment auxiliary chemicals.

In Table 3.12, non-standardized coefficient of canonical discrimination function is exhibited. Discrimination function is exhibited in (3.3) based on this.

Table 3.12. Non-standardized coefficient of canonical discrimination function

	Function 1
Q10	1.082
Q11	-.633
Q12	.672
Q13	1.367
Q14	.965
Q15	-.143
(Constant)	-4.465

$$Z = -4.465 + 1.082Q10 - 0.633Q11 + 0.672Q12 + 1.367Q13 + 0.965Q14 - 0.143Q15 \quad (3.3)$$

In this case, Discrimination hitting ratio is 68.9% and nearly 2/3 is discriminated properly.

Thus, contribution of the item "Want to use it in the cooking" is high concerning the utilization of the Rare Sugar.

3.4 Q25:Q16-22 Interest in a Diet

Discrimination analysis by Quantification Method II is executed. Outer criterion is set Q25 "Do you take interest in a diet?". Explanation variables are set for Q16-22 "Anxiety in using the Rare Sugar".

Eigenvalue is exhibited in Table 3.13 and Wilks' Lambda is exhibited in Table 3.14.

Table 3.13. Eigenvalue

Function	Eigenvalue	Variance (%)	Accumulation (%)	Canonical Correlation
1	.115 ^a	100.0	100.0	.321

Table 3.14. Wilks' Lambda

Test	Wilks' Lambda	χ^2	Degree of Freedom	Significance probability
1	.897	17.635	7	.014

From Table 3.13, canonical correlation coefficient is 0.321 and it is low. But from Table 3.14, Wilks' Lambda is 0.897 and is 0.014 in Significance probability therefore it is statistically significant by 5 % significance level. Coefficient of standardized canonical discrimination function is exhibited in Table 3.15 and its graph is exhibited in Figure 3.4.

Table 3.15. Coefficient of standardized canonical discrimination function

	Function 1
Q16	.436
Q17	.406
Q18	-.526
Q19	.458
Q20	.069
Q21	.271
Q22	-.003

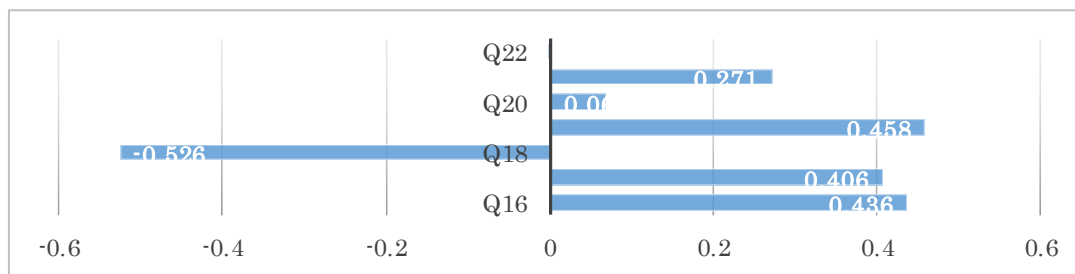


Figure 3.4. Chart of the Coefficient of standardized canonical discrimination function

From Table 3.15 and Figure 3.4, the biggest factor of contribution statistics concerning "Interest in a diet" is Q18 "Cannot grasp the concrete effect" and the next one is Q19 "Cannot have confidence that it is safe for anybody", Q16 "Not so popular", Q17 "Seems to be expensive" which means that it is a factor concerning the question while usage.

In Table 3.16, non-standardized coefficient of canonical discrimination function is exhibited. Discrimination function is exhibited in (3.4) based on this.

Table 3.16. Non-standardized coefficient of canonical discrimination function

	Function 1
Q16	.998
Q17	.862
Q18	-1.047
Q19	.967
Q20	.142
Q21	.604
Q22	-.005
((Constant)	-3.177

$$Z = -3.177 + 0.998Q16 + 0.862Q17 - 1.047Q18 + 0.967Q19 + 0.142Q20 + 0.604Q21 - 0.005Q22 \quad (3.4)$$

In this case, Discrimination hitting ratio is 65.5% and nearly 2/3 is discriminated properly.

Thus, contribution of the item that concrete effect of the Rare Sugar cannot be found is high concerning the interest in a diet.

3.5 Q26:Q10-15 Be Careful for the Health

Discrimination analysis by Quantification Method II is executed. Outer criterion is set Q26” Are you careful for the health?”. Explanation variables are set for Q10-15 “How do you want to use the Rare Sugar?”.

Eigenvalue is exhibited in Table 3.17 and Wilks’ Lambda is exhibited in Table 3.18.

Table 3.17. Eigenvalue

Function	Eigenvalue	Variance (%)	Accumulation (%)	Canonical Correlation
1	.108 ^a	100.0	100.0	.312

Table 3.18. Wilks’ Lambda

Test	Wilks’ Lambda	χ^2	Degree of Freedom	Significance probability
1	.902	16.632	6	.011

From Table 3.17, canonical correlation coefficient is 0.312 and it is low. But from Table 3.18, Wilks’ Lambda is 0.902 and is 0.011 in Significance probability therefore it is statistically significant by 5 % significance level. Coefficient of standardized canonical discrimination function is exhibited in Table 3.19 and its graph is exhibited in Figure 3.5.

Table 3.19. Coefficient of standardized canonical discrimination function

	Function 1
Q10	.587
Q11	-.397
Q12	.352
Q13	.345
Q14	.213
Q15	.314

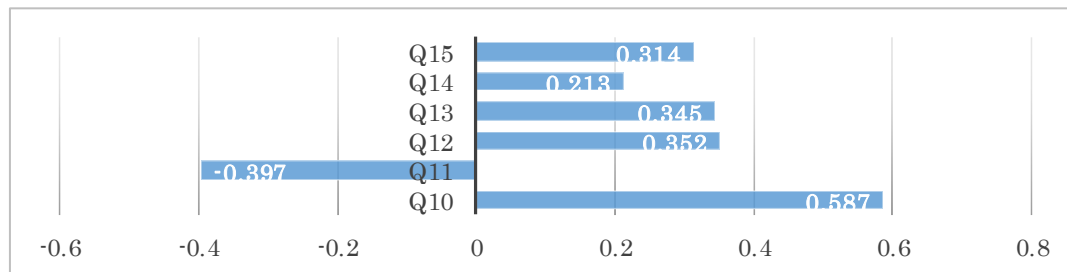


Figure 3.5. Chart of the Coefficient of standardized canonical discrimination function

From Table 3.19 and Figure 3.5, the biggest factor of contribution statistics concerning ” Be careful for the health” is Q10”Want to use it in cooking” and the next one is Q11” Can easily use it if there is a recipe”, Q12”Want to know where I can buy it because I want to use it as a seasoning”, Q13”Want to know where I can get information because I want to use it as a supplement”, which means “Cooking and supplement”.

In Table 3.20, non-standardized coefficient of canonical discrimination function is exhibited. Discrimination function is exhibited in (3.5) based on this.

Table 3.20. Non-standardized coefficient of canonical discrimination function

	Function 1
Q10	1.192
Q11	-1.058
Q12	.714
Q13	.960
Q14	.458
Q15	.651
(Constant)	-4.323

$$Z = -4.323 + 1.192Q10 - 1.058Q11 + 0.714Q12 + 0.960Q13 + 0.458Q14 + 0.651Q15 \quad (3.5)$$

In this case, Discrimination hitting ratio is 64.1% and nearly 2/3 is discriminated properly.

Thus, contribution of the utilization of the Rare Sugar to cooking is high concerning "Be careful for the health" therefore producer and seller are required to cope with this request.

3.6 Q26:Q16-22

Discrimination analysis by Quantification Method II is executed. Outer criterion is set Q26" Are you careful for the health?". Explanation variables are set for Q16-22 "Anxiety in using the Rare Sugar".

Eigenvalue is exhibited in Table 3.21 and Wilks' Lambda is exhibited in Table 3.22.

Table 3.21. Eigenvalue

Function	Eigenvalue	Variance (%)	Accumulation (%)	Canonical Correlation
1	.121 ^a	100.0	100.0	.329

Table 3.22. Wilks' Lambda

Test	Wilks' Lambda	χ^2	Degree of Freedom	Significance probability
1	.892	18.601	7	.010

From Table 3.21, canonical correlation coefficient is 0.329 and it is low. But from Table 3.22, Wilks' Lambda is 0.892 and is 0.010 in Significance probability therefore it is statistically significant by 5 % significance level. Coefficient of standardized canonical discrimination function is exhibited in Table 3.23 and its graph is exhibited in Figure 3.6.

Table 3.23. Coefficient of standardized canonical discrimination function

Function 1	
Q16	-.105
Q17	.206
Q18	-.161
Q19	.422
Q20	.078
Q21	.091
Q22	.666

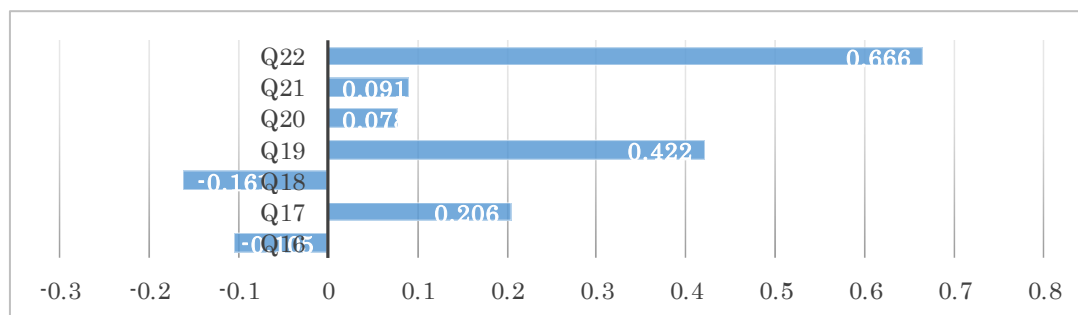


Figure 3.6. Chart of the Coefficient of standardized canonical discrimination function

From Table 3.23 and Figure 3.6, the biggest factor of contribution statistics concerning "Be careful for the health" is Q22"Cannot guess how I should use the Rare Sugar to what kind of cooking" and the next one is Q19" Cannot have confidence that it is safe for anybody", Q17"Seems to be expensive", which means "Effective cooking method, safety and economic efficiency".

In Table 3.24, non-standardized coefficient of canonical discrimination function is exhibited. Discrimination function is exhibited in (3.6) based on this.

Table 3.24. Non-standardized coefficient of canonical discrimination function

	Function 1
Q16	-.236
Q17	.435
Q18	-.322
Q19	.895
Q20	.162
Q21	.203
Q22	1.393
(Constant)	-3.707

$$Z = -3.707 - 0.236Q16 + 0.435Q17 - 0.322Q18 + 0.895Q19 + 0.162Q20 + 0.203Q21 + 1.393Q22 \quad (3.6)$$

In this case, Discrimination hitting ratio is 64.9% and nearly 2/3 is discriminated properly.

Thus, in order to make the Rare Sugar prevail to those who are careful for the health, uncomplicated communication of information is required.

4. Remarks

From the basic statistical results, nearly 90 % examinees know the Rare Sugar and nearly 2/3 of them have ate or drunk the food in which the Rare Sugar is included. 1/4 of examinees had an effect of the Rare sugar who have used it more than 1 month but 2/3 of them could not confirm the distinct effect. Nearly 70 % of examinees want to eat and drink the Rare sugar. Furthermore they want to use it as a “Supplement”, “Recipe”, “Tool for treatment” and “Cooking”. While the anxiety factors are “Not so famous”, “Rarely can be seen in shops”, “Economic efficiency”, “Safety”, and “Surrounding people do not use it so often”.

Therefore uncomplicated communication information is essential in order to make the Rare Sugar prevail.

By the analysis Quantification Method II, contribution of the factor “Want to use it in cooking” is high in discrimination of “Effect” and those of “Cooking” is high for the desire of drinking and eating in the future. Contribution of the factor as cooking and supplement is high in discrimination of “Interest in a diet”. Contribution of the factor “Concrete effect”, “Safety”, “Know well”, and “Question while using” are high for the doubt and anxiety during this case. Contribution of the factor “How to use the Rare Sugar in cooking” and “Enhancement of recipe” are high for the daily consciousness of health. Contribution of the factor “Effective cooking method” is high for the doubt and anxiety while in this case.

These knowledge would be an important and helpful information for the effort to prevail the Rare Sugar.

Further study on this should be performed such as text mining analysis.

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. There are few related papers concerning the marketing research and its utilization of this matter. In this paper, a questionnaire investigation was executed in order to clarify consumers’ current condition and their consciousness, and to seek the possibility of utilizing the Rare Sugars. Fundamental statistical analysis, Multivariate Analysis by Using Quantification Method II were executed based on that.

From the basic statistical results, nearly 90 % examinees know the Rare Sugar and nearly 2/3 of them have ate or drunk the food in which the Rare Sugar is included. 1/4 of examinees had an effect of the Rare sugar who have used it more than 1 month but 2/3 of them could not confirm the distinct effect. Nearly 70 % of examinees want to eat and drink the Rare sugar. Furthermore they want to use it as a “Supplement”, “Recipe”, “Tool for treatment” and “Cooking”. While the anxiety factors are “Not so famous”, “Rarely can be seen in shops”, “Economic efficiency”, “Safety”, and “Surrounding people do not use it so often”.

Therefore uncomplicated communication information is essential in order to make the Rare Sugar prevail.

By the analysis Quantification Method II, contribution of the factor “Want to use it in cooking” is high in discrimination of “Effect” and those of “Cooking” is high for the desire of drinking and eating in the future. Contribution of the factor as cooking and supplement is high in discrimination of “Interest in a diet”. Contribution of the factor “Concrete effect”, “Safety”, “Know well”, and “Question while using” are high for the

doubt and anxiety during this case. Contribution of the factor “How to use the Rare Sugar in cooking” and “Enhancement of recipe” are high for the daily consciousness of health. Contribution of the factor “Effective cooking method” is high for the doubt and anxiety while in this case.

These knowledge would be an important and helpful information for the effort to prevail the Rare Sugar.

The effectiveness of this method should be examined in various cases.

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Appendix. Questionnaire about the Rare Sugars

◆Questionnaire about the Rare Sugars◆						2015/6/15					
The Rare Sugars exist naturally and have many kinds (more than 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 column for Q7, 8, 10-23, 25-27)											
1. We ask you about the Rare Sugars.											
1-1. Do you know the Rare Sugars?											
Q1	① Know ② Do 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	① TV ② Magazine ③ Newspaper ④ Shop ⑤ Vending Machine ⑥ Seminar ⑦ Internet ⑧ Hear from another person ⑨ Miscellaneous ()										
1-3. Do you know that the Rare Sugar has effect on obese prevention and/or diabetes prevention etc.?											
Q3	① Know ② Do not know										
1-4. Have you heard or used the syrup which includes Rare Sugar "Rare Sugar Sweet"?											
Q4	① Heard ② Not heard										
Q5	① Used ② Not used										
1-5. Have you drunk or eaten the food which includes the Rare Sugar?											
Q6	① Yes ② No										
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)				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do 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?				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do 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	① Cake ② Juice ③ Japanese food ④ Western food ⑤ Chinese food ⑥ Miscellaneous ()										
1-9. How do you want to use the Rare Sugar?											
Q10	a. I want to use it in the cooking.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q11	b. I can easily use it if there is a recipe.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q12	c. I want to know where I can buy it because I want to use it as a seasoning.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q13	d. I want to know where I can get information because I want to use it as a supplement.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q14	e. I want to know the hospital where the Rare Sugar is used as a tool for treatment.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q15	f. I want to know how long I should use it in order to confirm the effectiveness.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
1-10. Do you have a question (doubt) or anxiety for the Rare Sugar?											
Q16	a. It is not so popular.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q17	b. It seems to be expensive.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q18	c. I cannot grasp the concrete effect.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q19	d. I cannot have confidence that it is safe for anybody.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q20	e. Surrounding people do not use it so often.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q21	f. I cannot find the food in the shop in which the Rare Sugar is included.				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q22	g. I cannot guess how I should use the Rare Sugar to what kind of cooking?				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q23	h. Miscellaneous ()				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
1-11. Choose the drink that you are interested in. [Plural answers are allowed]											
Q24	① Dajuru ② OS-1 (oral rehydration solution Drink for sports) ③ designated health drink ④ drink with the Rare Sugar ⑤ None ⑥ Miscellaneous ()										
Q25	1-12. Do you take interest in a diet?				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q26	1-13. Are you careful for the health?				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
Q27	1-14. Do you take interest in the designated health food?				① Think it very much	② Slightly think so	③ Cannot say either	④ Slightly do not think so	⑤ Do not think so		
1-15. Which method would be suitable for the Rare Sugar to become popular?											
Q28	① TV CM ② Use Twitter, Facebook ③ Advertisement by the company ④ Spread the way of cooking ⑤ Sell candy with the Rare Sugar ⑥ Sell juice with the Rare Sugar ⑦ Restaurant at which the Rare Sugar is used in the cooking ⑧ Use it in the food at the hospital ⑨ Sell it as a supplement ⑩ Make promotion by utilizing famous sportsmen or entertainers ⑪ Miscellaneous ()										

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-sauce ④Japanese liquor-sake 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					

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