



Comparison between Threshold of Saltiness Perception and Blood Pressure for Resident Health Examination in Yakumo Town

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Received Date: April 04, 2020; **Accepted Date:** April 09, 2020; **Published Date:** April 20, 2020

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Abstract

Japan is a super-aged society. The whole country is working to extend healthy life expectancy, aiming for healthy longevity. Various events organized by public health centers have been held to prevent dementia and other diseases for elderly people and people aged 65 and over in Japan. In Alzheimer's dementia, many researchers report that the sense of smell declines as an early and early symptom. It has also been reported that malnutrition affects taste (such as zinc deficiency). Dementia starts in the 40's and manifests over 20 years of apparent symptoms, so early detection is important. In this report, we report on the results of the taste test using the Salsave and Tastediscs in 2019 at Yakumo Town Resident Examination, which has been ongoing since 2007. From the database, 298 participants (169 females and 129 males) were selected from data in August, 2019. The saltiness test was performed using test paper SALSAVE (ADVANTEC Co. Ltd.), which include 7 different densities of NaCl on a test paper namely: 0.0, 0.6, 0.8, 1.0, 1.2, 1.4 and 1.6 mg/cm², respectively. And also, the saltiness test was performed using test paper with liquid TASTEDISC (Sanwa Chemical Laboratory Co., Ltd) which include 5 different densities of NaCl on a liquid with test paper namely: 1(0.3%), 2(1.25%), 3(5%), 4(10%), 5(20%). As a result, 16 males out of 129 male participants (12.4%) and 11 females of 169 female participants (6.5%) had abnormal values in salt taste test (Salsave) results. As a result, 8 males out of 129 male participants (6.2%) and 10 females of 169 female participants (5.9%) had abnormal values in salt taste test (Tastedisc) results. Two salty test results were compared with blood pressure results to determine their relationship to blood pressure, but there was no statistically significant difference between normal and otherwise. In the data comparing with and without hypertension, the results of the Salsave test were not statistically significant, and the Tastediscs were not also statistically significant. However, when comparing the results of the Salsave and the Tastedisc, participants having a higher saltiness threshold were able to be captured because the taste disc had a wider concentration range. Although there was no apparent statistically significant difference between the saltiness test and the blood pressure measurement in the present results, it is necessary to further examine the number of cases in the future. When performing a salty taste test in a resident health examination, it is necessary to separately give guidance in advance on the results with and without hypertension.

Keywords: Gender; Healthy Elderly People; Saltiness; Taste Function; Yakumo Study

Introduction

Japan is aging and has become a super-aged society as of 2020. The Japanese government is working with prefectures to take measures to extend healthy life expectancy, aiming for healthy longevity. We are recruiting participants for various events, such as cooking classes for preventing undernutrition of the elderly, exercise for preventing dementia, and cooking classes. A low-salt cooking class is also held to prevent high blood pressure. Alzheimer's dementia begins in the 40's and begins in the 60's, so early detection and early treatment are needed. Early symptoms of Alzheimer's dementia include decreased olfaction and reduced taste. Taste and smell tests are often not included in health checks. However, we believe that it is necessary to extend healthy life expectancy in the future, aiming for healthy longevity. From the viewpoint of preventing metabolic syndrome, measures to prevent hypertension, diabetes, and dyslipidemia must be taken. It is necessary to further enhance nutrition classes and nutrition guidance for the elderly. In particular, instruction on reducing salt is important for Japanese people, and instruction is also provided on cooking methods to reduce the amount of salt used in Japanese food. According to the 2020 Japanese dietary intake standard, it is recommended that males should have a salt intake of 7.0g or less and females should have a salt intake of 6.5g or less per day. However, in reality, about 10g of salt is consumed, so it is necessary to promote dietary improvement for salt reduction. Although quick foods and processed foods contain a large amount of salt, government are asking them to reduce their consumption as much as possible, but it is very difficult in modern social situations. The relationship between salt intake and blood pressure [1], the relationship between hypertensive patients and salt intake [2-4], and the relationship between diet and blood pressure at a young age [5] have been studied and reported. In each case, the results were in patients or young workers, indicating that those with higher blood pressure had a higher saltiness threshold. In 2018, we performed a taste test using Solseve during a health check-up in Y town [6]. Solseve is a simple salty threshold test [7].

Therefore, the purpose of this study was to understand the relationship between blood pressure and saltiness by performing saltiness threshold tests (Salsave and Tastdisc) at the annual resident health examination for middle-aged and elderly people in Yakumo Town, Hokkaido, where population movement is small.

Materials and Methods

Participants

The participants were community dwellers who voluntarily participated in the Yakumo Study and had managed their everyday life themselves. The Yakumo Study was conducted since 1981 as a joint project between the town of Yakumo in Hokkaido and the Nagoya University Graduate School of Medicine. Professionals in the fields of epidemiology, internal medicine, orthopedics, neuropsychology, ophthalmology, otolaryngology, and urology joined the Yakumo Study. The analysed data were based on the database from 2019 from the neuropsychology and otolaryngology teams. The participants had been engaged in a variety of jobs, not only white collar but also in agriculture, fishery, and forestry. Therefore, this town can be regarded as representative of today's Japanese society. From the database, 298 participants (169 females and 129 males) were selected from data in August, 2019 (Table 1).

Participants	40's	50's	60's	70's	80's
Male (129)	10	24	49	40	6
Female (169)	23	40	66	37	3
Total (298)	33	64	115	77	9

Table 1: Age composition of participants in Yakumo inhabitants examination (n=298).

Assessment of Salt Taste Identification

The gustatory test was performed using test paper SALSAVE (ADVANTEC Co.Ltd.), which include 7 different densities of NaCl on a test paper, as follows: 0.0, 0.6, 0.8, 1.0, 1.2, 1.4 and 1.6 mg/cm², respectively. The participants placed a test paper on the tongue and closed the mouth to feel the taste. We inspect it from the light taste. The participants understood that taste is detection and that saltiness is recognition. Firstly, the participant rides 0.0% of test papers on the tongue and checks taste. The participant learns and checks the taste on a tongue from a test paper having low density of NaCl sequentially. There is the report that detection of salt taste is more important than recognition to salt taste (Nishimoto et al., 2005). We defined it as follows: normal range as 0.6 to 1.0%, border as 1.2 to 1.4%, and abnormal as 1.6 to more than 1.6%, respectively. All of these methods are the same as in the previously reported paper (Katayama, 2018). And also, the saltiness test was performed using test paper with liquid TASTEDISC (Sanwa Chemical Laboratory Co., Ltd) which include 5 different densities of NaCl on a liquid with test paper namely: 1(0.3%), 2(1.25%), 3(5%), 4(10%), 5(20%).

Ethical Review Board

This study was conducted with the approval of the Ethical Review Board (Nagoya women's university 'hitowo mochiita kennkyuuni kansuru iinnkai'). The approval number is 30-14

Statistical Processing

The test results were confirmed to be normal distribution by F-test. Data that was normally distributed was compared with Student-t without correlation of parametric test. The data that was not normally distributed was compared without correlated Mann-Whitney test of the non-parametric test. In comparing the taste test and the olfactory test result performed on the same participant, with correlated Wilcoxon test of the non-parametric test.

Results

Participant's Body Composition and Blood Pressure

Data on body composition and blood pressure of participants are shown by age. The males are shown in (Table 2). And the females are shown in (Table 3). All data are shown as averages by age. For both males and females, the mean values of blood pressure for each age were in the normal range. Body fat percentage was higher in females than in males, and BMI was almost normal for both males and females.

	Number	Age	Height cm	Weight g	Waist cm	BMI kg/m/m	Body fat rate %	Systolic blood pressure mmHg	Dyastolic blood pressure mmHg	Pulse
Average of 40's Male	10	45.5	170.1	74.2	84.8	25.7	23.7	136.8	80.9	72.1
Average of 50's Male	24	54.8	168	71.3	86.7	25.4	24.4	131	81.3	71.5
Average of 60's Male	49	64.8	167.3	68.9	86.5	24.6	24.7	138.3	83.1	72.2
Average of 70's Male	40	73	164.7	66.2	84.6	24.4	23.7	145.5	79.7	70.3
Average of 80's Male	6	84.8	159.1	63.5	87.4	25.1	24.3	134.7	66.2	70.3
Total average of Male	129	64.9	166.4	68.7	85.8	24.8	24.2	138.9	80.8	71.4

Table 2: Saltiness test (Solsave and Tastedisc) results and blood pressure and body composition results (Average for Males in their 40's to 80's).

	Number	Age	Height cm	Weight g	Waist cm	BMI kg/m/m	Body fat rate %	Systolic blood pressure mmHg	Dyastolic blood pressure mmHg	Pulse
Average of 40's Female	23	45.2	158	57.2	76.7	22.8	33.2	122.3	70.1	80.6
Average of 50's Female	40	54.3	155.5	56.4	76.8	23.3	33.4	131.6	77.4	75
Average of 60's Female	66	64.5	153.8	55.7	77.7	23.5	33.9	137.1	77	76.3
Average of 70's Female	37	72.8	150.6	52.8	76.2	23.3	33.1	140.1	74.7	74.4
Average of 80's Female	3	82	147.4	49.6	78.1	22.9	31.1	149	77	76
Total average of Female	169	61.6	154	55.3	77	23.3	33.4	134.7	75.7	76.1

Table 3: Saltiness test (Solsave and Tastedisc) results and blood pressure and body composition results (Average for Females in their 40's to 80's).

Assessment of Salt Taste Identification

Salt taste identification was performed by using test paper SALSAVE (ADVANTEC Co. Ltd) and TASTDESC (Sanwa Chemical Laboratory Co., Ltd). (Table 4) and (Table 5) show the saltiness measurement results for male and female by age. The salty results using Solseve were classified as follows. The normal range is 0.6%, 0.8, and 1.0%. The observation range is 1.2%, 1.4%, and 1.6%. The consultation range is more than 1.6%. The salty results using Tastedisc were classified as follows. The normal range is 0.3% and 1.25%. The observation range is 5.0% and 10.0%. The consultation range is 20.0% and more than 20.0%. Salsave can be tested for sensitivity to rather low salty concentrations. Tastedisc can be tested for sensitivity to rather high salty concentrations. As a result, 16 males of 129 male participants (12.4%) and 11 females of 169 female participants (6.5%) had abnormal values in saltesave test results. Males almost twice as many as females required consultation. As a result, 8 males of 129 male participants (6.2%) and 10 females of 169 female participants (5.9%) had abnormal

values in tastedisc test results. Male and female results were about the same. Among male and female salty test results, 51.6% of male and 62.1% of female had both tests in the normal range. Females had about 10.5% better salt test results than males.

(n=129)	Solsave			Tastedisc			Solsave and Tastedisc				
	Normal 0.6% ,0.8%, 1.0%	Observa tion on 1.2%, 1.4%,1.6 %	Consulta tion 1.6 % more	Nor mal 0.3% , 1.25 %	Observa tion on 5.0%, 10.0%	Consulta tion 20.0 % or more	Nor mal Both	Nor mal one side	Observa tion Both	Observa tion on One side	Consulta tion both
Male 40's (n=10)	8	3	0	6	4	0	4	5	1	0	0
Male 50's (n=24)	16	5	3	14	10	0	10	10	2	2	0
Male 60's (n=49)	39	5	5	33	11	5	27	18	1	1	2
Male 70's (n=40)	30	2	8	29	9	2	23	13	1	1	2
Male 80's (n=6)	4	1	0	2	3	1	2	3	0	1	0
Male total	97	16	16	84	37	8	66	49	5	5	4

Table 4: Saltiness test (Solsave and Tastedisc) results (Number of Males in their 40's to 80's).

(n=169)	Solsave			Tastedisc			Solsave and Tastedisc				
	Normal 0.6%,0. 8%, 1.0%	Observa tion 1.2% , 1.4% ,1. 6%	Consulta tion 1.6% more	Normal 0.3%,1. 25%	Observa tion 5.0% , 10.0%	Consulta tion 20.0% or more	Nor mal Both	Nor mal One	Observa tion Both	Observa tion one side	Consulta tion Both
Female 40's (n=23)	18	4	1	19	4	0	15	7	0	1	0
Female 50's (n=40)	32	5	3	34	6	0	28	10	1	1	0
Female 60's (n=66)	54	9	3	49	10	7	41	21	2	1	1
Female 70's (n=37)	29	5	3	25	9	3	20	14	1	1	1
Female 80's (n=3)	2	0	1	2	1	0	1	2	0	0	0
Female total	135	23	11	129	30	10	105	54	4	4	2

Table 5: Saltiness test (Solsave and Tastedisc) results (Number of Females in their 40's to 80's).

Statistical Processing Results

Each salty test result was statistically processed. (Table 6) shows the results of comparison of the saltiness test results using Salesave with normal systolic and diastolic blood pressure values and other. Likewise, (Table 7) shows the results of comparison of the saltiness test results using Tastedisc with normal systolic and diastolic blood pressure values and other. In addition, (Table 8) compares the systolic and diastolic blood pressures of participants in both normal salt test ranges and those in other ranges. (Table 9) compares the systolic and diastolic blood pressures of the participants in the normal range of both or one of the two salty test results, and those of the other participants. The results did not show a statistically significant difference in either case.

Solsave	Saltiness test results and systolic blood pressure measurement results		Saltiness test results and diastolic blood pressure measurement results	
	Normal range 0.6%, 0.8%,1.0%	Observation or Consultation 1.2%,1.4%,1.6%,1.6%以上	Normal range 0.6%,0.8%,1.0%	Observation or Consultation 1.2%,1.4%,1.6%,1.6%以上
Blood pressure±Standard deviaton (mmHF test)	145.8±20.2	138.8±21.9	77.9±12.7	77.7±11.3
Unpaired Student-t test	P=0.233		P=0.138	
Mann- Whitney test	P=0.295		P=0.921	

Table 6: Statistical comparison of salty test results (Solsave) and blood pressure measurement results.

Tastedisc	Saltiness test results and systolic blood pressure measurement results		Saltiness test results and diastolic blood pressure measurement results	
	Normal range 0.3%, 1.25%	Observation or Consultation 5.0%,10.0%,20.0%, 20.0%以上	Normal range 0.3%, 1.25%	Observation or Consultation 5.0%,10.0%,20.0%, 20.0%以上
Blood pressure±Standard deviaton (mmHF test)	136.9±21.9	135.4±17.1	77.9±12.7	77.7±11.3
Unpaired Student-t test	P=0.005**		P=0.850	
Mann- Whitney test	P=0.887		P=0.850	

Table 7: Statistical comparison of salty test results (Tastedisc) and blood pressure measurement results.

Solsave and Tastedisc	Systolic blood pressure measurement results		Dyastolic blood pressure measurement results	
	Both test results are normal	Observation or consultation one or both	Both test results are normal	Observation or consultation one or both
Blood pressure±Standard deviaton (mmHF test)	136.4±21.2	1386.6±19.8	78.4±13.3	77.2±10.9
Unpaired Student-t test	P=0.197		P=0.009**	
Mann- Whitney test	P=0.985		P=0.734	

Table 8: Statistical comparison of blood pressure measurement results between participants who were in the normal rengo for two kinds of saltiness test results and those who were not.

Solsave and Tastedisc	Systolic blood pressure measurement results		Dyastolic blood pressure measurement results	
	Normal one or both	Both test results are Observation or Consultation	normal one or both	Both test results are Observation or Consultation
Blood pressure±Standard deviaton (mmHF test)	136.4±21.2	136.6±19.8	77.7±12.5	79.6±10.7
Unpaired Student-t test	P=0.958		P=0.184	
Mann- Whitney test	P=0.586		P=0.467	

Table 9: Statistical comparison of blood pressure measurement results between participants who were in the normal rengo (one or both) for two kinds of saltiness test results and those who were not.

Comparison of saltiness test results with normal values of blood pressure (Table 10) and (Table 11), BMI (Table 12), and waist circumference (Table 13) and (Table 14). Of the salty test results, statistical processing was performed with the normal range changed to 1, the observation required was changed to 2, and the consultation required was changed to 3. No statistically significant difference was shown in these results. However, in systolic blood pressure, the results of comparison between Salesave and Tastedisc showed a statistically significant difference. It was found that the Tastedisc had a higher saltiness threshold than Salesave.

	Systolic blood pressure (mmHg)		Salesave test result (Normal=1, Observation = 2, Consultation =3)		Tastedisc test result (Normal=1, Observation = 2, Consultation =3)		Salesave and Tastedisc test result for less than 120 (Normal=1, Observation = 2, Consultation =3)		Salesave and Tastedisc test result for 120 or more (Normal=1, Observation = 2, Consultation =3)	
	Less than 120	120 or more	Systolic blood pressure Less than 120	Systolic blood pressure 120 or more	Systolic blood pressure Less than 120	Systolic blood pressure 120 or more	Salesave	Tastedisc	Salesave	Tastedisc
Average±Standard deviation	108.934±19.003	144.616±16.889	1.171±0.500	1.126±0.332	1.297±0.567	1.354±0.589	1.203±0.468	1.297±0.567	1.126±0.332	1.354±0.689
F test	P=0.0001**		P=0.0001**		P=0.356		P=0.050*		P=0.0001**	
Unpaired student – t test					P=0.467					
Mann-Whitney test	P=0.0001**		P=0.581							
Paired student-t test							P=253			
Willcoxon test									P=0.0001**	

Table 10: Results of statistical comparison of Saltness test results between fasting systolic blood pressure level less than 120 (Normal value) and 120 or more.

	Diastolic blood pressure (mmHg)		Salesave test result (Normal=1, Observation = 2, Consultation =3)		Tastedisc test result (Normal=1, Observation = 2, Consultation =3)		Salesave and Tastedisc test result for less than 90 (Normal=1, Observation = 2, Consultation =3)		Salesave and Tastedisc test result for 90 or more (Normal=1, Observation = 2, Consultation =3)	
	Less than 90	90 or more	Diastolic blood pressure Less than 90	Diastolic blood pressure 90 or more	Diastolic blood pressure Less than 90	Diastolic blood pressure 90 or more	Salesave	Tastedisc	Salesave	Tastedisc
Average±Standard deviation	73.984±8.903	97.180±8.329	1.352±0.579	1.280±0.607	1.352±0.579	1.280±0.607	1.352±0.579	1.306±0.626	1.306±0.619	1.280±0.607
F test	P=0.291		P=0.349		P=0.349		P=0.109		P=0.446	
Unpaired student – t test	P=0.0001**		P=0.425		P=0.425					
Mann-Whitney test										
Paired student-t test							P=0.384		P=0.811	
Willcoxon test										

Table 11: Results of statistical comparison of Saltiness test results between fasting diastolic blood pressure level less than 90 (Normal value) and 90 or more.

	BMI (kg/m/m/)		Saltness test result (Normal=1, Ovservation = 2, Consultation =3)		Saltness test result (Normal=1, Ovservation = 2, Consultation =3)		Salsave and Tastedisc test result for less tha 120 (Normal=1, Ovservation = 2, Consultation =3)		Salsave and Tastedisc test result for 120 or more (Normal=1, Ovservation = 2, Consultation =3)	
	Less than 25.0	2.50 or more	BMI Less than 25.0	BMI 2.50 or more	BMI Less than 25.0	BMI 2.50 or more	Salsave	Tastedisc	Salsave	Tastedisc
Average±Standard deviation	27.548±2.143	32.993±2.439	1.333±0.641	1.263±0.596	1.363±0.613	1.304±0.533	1.333±0.641	1.363±0.613	1.304±0.533	1.263±0.596
F test	P=0.0001**		P=0.191		P=0.6045*		P=0.279		P=0.116	
Unpaired student - t test			P=0.346							
Mann-Whaitny test	P=0.0001**				P=0.613					
Paired student-t test							P=0.645		P=0.517	
Willcoxon test										

Table 12: Results of statistical comparison of saltness test results between fasting BMI level less than 25.0 (Normal value) and 25.0 or more.

	Waist (cm)		Saltness test result (Normal=1, Ovservation = 2, Consultation =3)		Saltness test result (Normal=1, Ovservation = 2, Consultation =3)		Salsave and Tastedisc test result for less tha 85.0 (Normal=1, Ovservation = 2, Consultation =3)		Salsave and Tastedisc test result for 85.0 or more (Normal=1, Ovservation = 2, Consultation =3)	
	Less than 85.0	85.0 or more	Waist Less than 85.0	Waist 85.0 or more	Waist Less than 85.0	Waist 85.0 or more	Salsave	Tastedisc	Salsave	Tastedisc
Average±Standard deviation	78.327±4.478	91.603±4.721	1.284±0.653	1.417±0.707	1.482±0.662	1.356±0.562	1.286±0.653	1.452±0.625	1.417±0.707	1.356±0.562
F test	P=0.334		P=0.259		P=0.097		P=0.359		P=0.026**	
Unpaired student - t test	P=0.0001**		P=0.285		P=0.245					
Mann-Whaitny test										
Paired student-t test							P=0.062			
Willcoxon test									P=0.504	

Table 13: Results of statistical comparison of Saltness test results between waist level than 85.0 (Normal value) and 85.0 or more for Male.

	Waist (cm)		Salttness test result (Normal=1, Ovservation = 2, Consultation =3)		Salttness test result (Normal=1, Ovservation = 2, Consultation =3)		Salsave and Tastedisc test result for less tha 90.0 (Normal=1, Ovservation = 2, Consultation =3)		Salsave and Tastedisc test result for 90.0or more (Normal=1, Ovservation = 2, Consultation =3)	
	Less than 90.0	90.0 or more	Waist Less than 90.0	Waist 90.0 or more	Waist Less than 90.0	Waist 90.0 or more	Salsave	Tastedisc	Salsave	Tastedisc
Average±Standard deviation	75.729±7.477	93.733±4.338	1.268±0.570	1.250±0.622	1.301±0.573	1.083±0.289	1.301±0.573	1.268±0.570	1.250±0.622	1.083±0.289
F test	P=0.0019**		P=0.393		P=0.005**		P=0.480		P=0.006**	
Unpaired student - t test			P=0.910							

Mann-Whitney test	P=0.0001**		P=0.186		
Paired student-t test				P=594	
Willcoxon test					P=0.423

Table 14: Results of statistical comparison of Saltiness test results between waist level than 90.0 (Normal value) and 85.0 or more for Female.

Discussion

With more than 40 million hypertensive patients in Japan, the Japanese government is conducting various events to reduce salt. The current situation where one in three Japanese people has high blood pressure is no longer an exaggeration to say that it is a national disease. If left untreated, hypertension increases the risk of heart disease and stroke. However, since there are few subjective symptoms, many people do not actively treat. The Japanese dietary intake standard 2020 recommends that males be reduced to 7.0g / day and females to 6.5g / day. However, in reality, it is very difficult to reduce the amount of salt in Japanese food, and cooking classes are being held at public health center to reduce salt. This study statistically analyzed the relationship between saltiness test results, blood pressure, BMI, and abdominal girth in health checkups conducted by residents in Yakumo, Hokkaido, where population migration was low. There was no statistically significant difference between the normal values of blood pressure, BMI, and waist circumference and the results of saltiness test results in other cases. Similarly, the blood pressure measurements were statistically compared between the normal range and the rest of the salty test results, but there was no significant difference. However, a statistical comparison of the Salesave and Tastedisc used in the saltiness test this time revealed that the threshold value of the Tastedisc was higher than that of the Salesave. From this, we believe that the relationship with blood pressure can be clarified by increasing the number of cases in the future. Japanese food, which is recognized worldwide as a healthy food, is famous for its varied menu. The disadvantage, however, is the high salt intake. Therefore, a new seasoning for salt reduction is required. In other Asian countries, as in Japan, it is reported that the relationship between the intake of salt in the diet and blood pressure is examined [8, 9], and that salt guidance is required [10, 11]. Of course, studies have been reported to improve the threshold of taste sensitivity to salt by effectively lowering salt blood pressure with new drugs [12]. However, if we can prevent high blood pressure from happening by improving your eating habits, we can achieve healthy longevity. It has been reported that the taste sensitivity of Alzheimer-type dementia patients to salty taste is reduced [13], so it is meaningful to conduct a salty threshold test at the time of a physical examination. And it is effective to use simple salty test results to provide dietary guidance to prevent hypertension during health examination. In the future, it will be possible to contribute to salt reduction measures by simultaneously examining the dietary content at the time of the health checkup and comparing it with the simple salty test results.

Conclusions

We obtained two kinds of saltiness test results, Salesave and Tastedisc, at the time of health check-up in Yakumo Town, Hokkaido, where population migration is low. From the database, 298 participants (169 females and 129 males) were selected from data in August, 2019. The saltiness test was performed using test paper SALSARE (ADVANTEC Co. Ltd.), which include 7 different densities of NaCl on a test paper namely: 0.0, 0.6, 0.8, 1.0, 1.2, 1.4 and 1.6 mg/cm², respectively. And also, the saltiness test was performed using test paper with liquid TASTEDISC (Sanwa Chemical Laboratory Co., Ltd) which include 5 different densities of NaCl on a liquid with test paper namely: 1(0.3%), 2(1.25%), 3(5%), 4(10%), 5(20%). As a result, 16 males out of 129 male participants (12.4%) and 11 females of 169 female participants (6.5%) had abnormal values in salt taste test (Salesave) results. As a result, 8 males out of 129 male participants (6.2%) and 10 females of 169 female participants (5.9%) had abnormal values in salt taste test (Tastedisc) results. Two salty test results were compared with blood pressure results to determine their relationship to blood pressure, but there was no statistically significant difference between normal and otherwise. However, a statistical comparison of the Salesave and Tastedisc used in the saltiness test this time revealed that the threshold value of the Tastedisc was higher than that of the Salesave. The relationship with blood pressure can be clarified by increasing the number of cases in the future.

Acknowledgements

This study was supported by the research aid of Choju-iryu-kenkyu-kaihatsuhi 30-14 and the Japanese Society of Taste Technology, 2019.

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Citation: Katayama N, Ito A, Hirabayashi M, Kondo S, Nakayama Y, et al. (2020) *Comparison between threshold of saltiness perception and blood pressure for resident health examination in Yakumo Town. Adv Nutri and Food Sci: ANAFS-181.*