

# Odour and salt taste identification in older adults: evidence from the Yakumo study in August 2014

## Abstract

**Background:** This study examined the relationship between olfactory function and taste function. A personal function test was calculated from the Yakumo study database, and the odour stick identification test and salt taste identification test were administered to healthy elderly people. The participants were community dwellers who voluntarily participated in the Yakumo Study and had managed everyday life by themselves. Totally, 358 people (152 male, 206 female) participated in Yakumo-cho inhabitant's examination of 2014. The average age of 152 male was 65.2±9.4 years old (40–80 years old). We used Sal save (product made in Advantec Co. Ltd.) for an examination of taste. We used Smelling stick (product made in Daiichi Kogyo Co. Ltd.) for olfactometry. In addition, the average age of 206 female was 63.7±10.6 years old (40–85 years old). The results showed that the performance score on odour identification test was better in female participants than male participants. The results of the salt taste identification test showed that the recognition of salt density was lower in female participants than in male participants. Because taste and olfactory cognitive abilities decline with age, the development of meals for the elderly requires a new approach. Meals for the elderly should be healthy, with a strong fragrance and a light taste of salt.

**Keywords:** olfactory function, taste function, healthy elderly people, Yakumo study

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Naomi Katayama,<sup>1,2,3</sup> Shoko Kondo,<sup>2</sup> Satofumi Sugimoto,<sup>3</sup> Seiya Goto,<sup>3</sup> Wakako Kinoshita,<sup>3</sup> Masaaki Teranishi,<sup>3</sup> Michihiko Sone,<sup>3</sup> Yasushi Fujimoto,<sup>3</sup> Hironao Otake,<sup>3,4</sup> Hirokazu Suzuki,<sup>5</sup> Naoki Saji,<sup>5</sup> Takafumi Nakada,<sup>5</sup> Seiichi Nakata,<sup>6</sup> Tsutomu Nakashima<sup>3,5,7</sup>

<sup>1</sup>Nagoya Women's University, Japan

<sup>2</sup>Graduate School of Nagoya Women's University, Japan

<sup>3</sup>Department of Otorhinolaryngology, Nagoya University

Graduate School of Medicine, Japan

<sup>4</sup>Department of Sleep Medicines, Nagoya University Graduate School of Medicine, Japan

<sup>5</sup>National Center for Geriatrics and Gerontology, Japan

<sup>6</sup>Department of Otolaryngology, Second Hospital Fujita Health University School of Medicine, Japan

<sup>7</sup>Ichinomiya Medical Treatment & Habilitation Center, Japan

**Correspondence:** Naomi Katayama, Nagoya Women's University, Nagoya city, Japan, Email [naok@nagoya-wu.ac.jp](mailto:naok@nagoya-wu.ac.jp)

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## Introduction

Japan is an ageing society. The proportion of elderly population in Japan will become the highest among the total population in the next ten years. It is thought that many elderly people enter the welfare institution. There is a concern that with increasing age, individuals would soon be unable to identify through the sense of smell. Furthermore, nasal congestion and olfactory disorders occurring after inflammation that are caused by allergic rhinitis, modern-day hay fever, and common colds also inhibit the sense of smell.<sup>1</sup> Both olfaction and gustation start to decline in humans around the age of 50–59 years, with 40% of the elderly experiencing a noticeable decline.<sup>2</sup> A person's first awareness of decline in olfaction as our primary dependence for identification of flavour occurs when one is unable to distinguish foods by taste alone. Olfaction also performs an important and essential role in our ability to detect dangers, including the smell of leaking gas, the burning odour of fire, and the putrid smell of rotten food. Olfaction is also responsible for enrichment and psychological stimulation in our everyday lives, such as with the scents and smells of foods and flowers.<sup>3</sup> In an already aged society, healthy olfaction is a necessary part of creating a safe and fertile living environment and for improving an individual's quality of life.

## Methods

The participants were community dwellers who voluntarily participated in the Yakumo Study and had managed their everyday life themselves. 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, 358 participants (206 female and 152 male) were selected from data in August, 2014. The Odour Stick

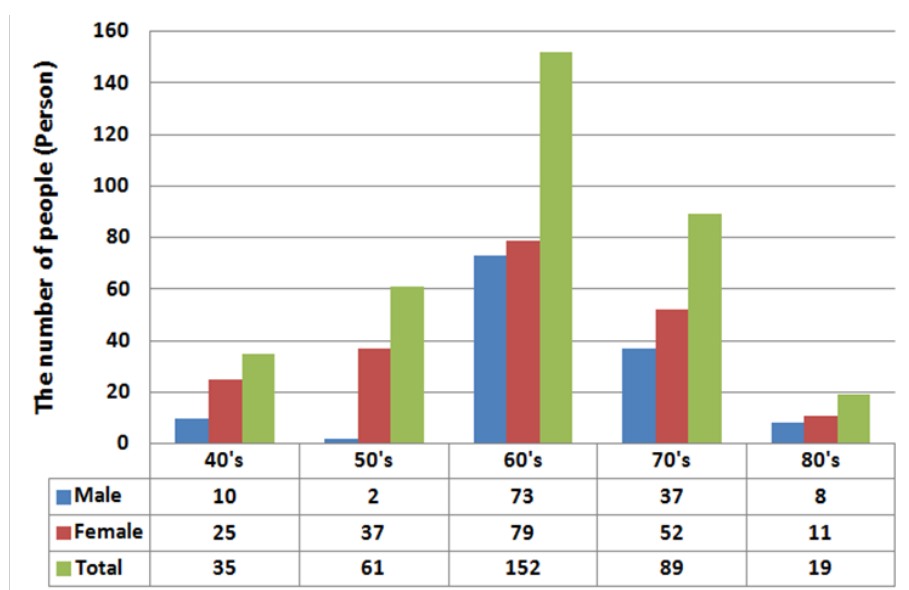
Identification Test (OSIT-J) was used to assess odour perception. This test possesses high reliability and validity.<sup>4</sup> The OSIT-J includes 12 different odorants to be identified. As odour perception is not necessarily culture-free, the Japanese version was employed.<sup>5,6</sup> The basic procedure resembles that of the San Diego Odour Identification Test.<sup>7</sup> 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 mg/cm<sup>2</sup>, 0.6 mg/cm<sup>2</sup>, 0.8 mg/cm<sup>2</sup>, 1.0 mg/cm<sup>2</sup>, 1.2 mg/cm<sup>2</sup>, 1.4 mg/cm<sup>2</sup>, and 1.6 mg/cm<sup>2</sup>. There is the report that detection of salt taste is more important than recognition to salt taste.<sup>8</sup> We defined it as follows: normal range as 0.6%–1.0%, border as 1.2%–1.4%, and abnormal as 1.6%–more than 1.6%.

## Results

As for the taste test result of the male, consultation required were 29 people, observation required were 74 people and normal level were 49 people. As for the taste test result of the female, consultation required were 13 people, observation required were 85 people and normal level were 104 people. In addition, as for the olfactometry result of the male, consultation required were 38 people, observation required were 35 people and normal level were 79 people. As for the olfactometry result of the female, consultation required were 27 people, observation required were 54 people and normal level were 124 people. We compared both taste and olfactometry result at the same time. As for the result in both, the male, consultation required were 10 people, observation required were 17 people and normal level were 27 people. As for the like female in both, consultation required were 0 people, observation required were 30 people and normal level were 63 people (Figures 1-3) (Table 1).

**Table 1** Result of taste and result of olfactometry according to the generation and Sex

Male 40's	Taste test	Olfactometry	Both	Female 40's	Taste test	Olfactometry	Both
The normal range	7	5	4	The normal range	21	13	11
Observation required	2	3	1	Observation required	4	8	2
Consultation required	1	2	0	Consultation required	0	3	0
Male 50's	Taste test	Olfactometry	Both	Female 50's	Taste test	Olfactometry	Both
The normal range	20	9	8	The normal range	29	20	15
Observation required	3	13	2	Observation required	4	15	1
Consultation required	1	2	8	Consultation required	4	2	0
Male 60's	Taste test	Olfactometry	Both	Female 60's	Taste test	Olfactometry	Both
The normal range	42	21	13	The normal range	49	36	26
Observation required	15	37	7	Observation required	25	36	16
Consultation required	16	15	5	Consultation required	5	5	0
Male 70's	Taste test	Olfactometry	Both	Female 70's	Taste test	Olfactometry	Both
The normal range	10	11	2	The normal range	22	28	10
Observation required	13	19	7	Observation required	19	21	9
Consultation required	14	7	3	Consultation required	11	3	0
Male 80's	Taste test	Olfactometry	Both	Female 80's	Taste test	Olfactometry	Both
The normal range	0	3	1	The normal range	3	7	1
Observation required	2	2	0	Observation required	2	4	2
Consultation required	6	4	2	Consultation required	6	0	0



**Figure 1** Yakumo-cho inhabitants examination (152 Male and 206 female).

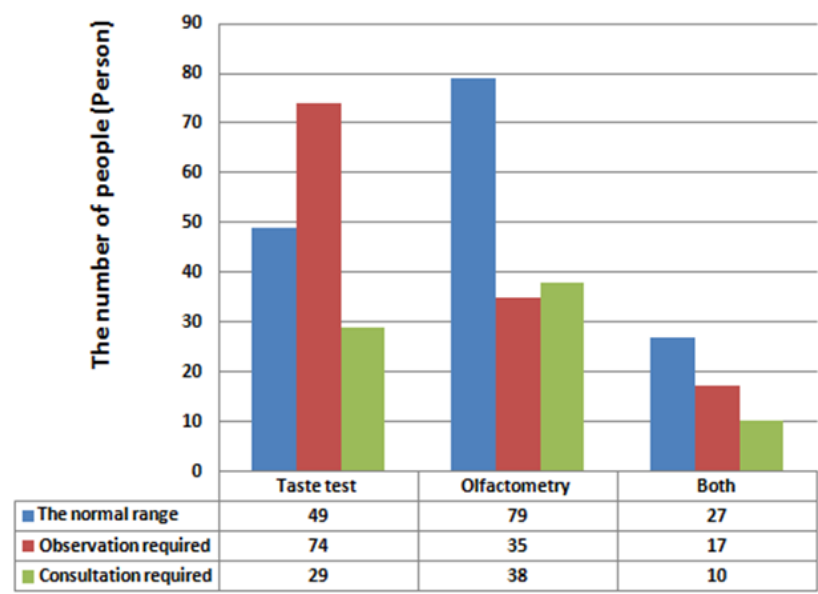


Figure 2 Taste and olfactory result of 152 Male.

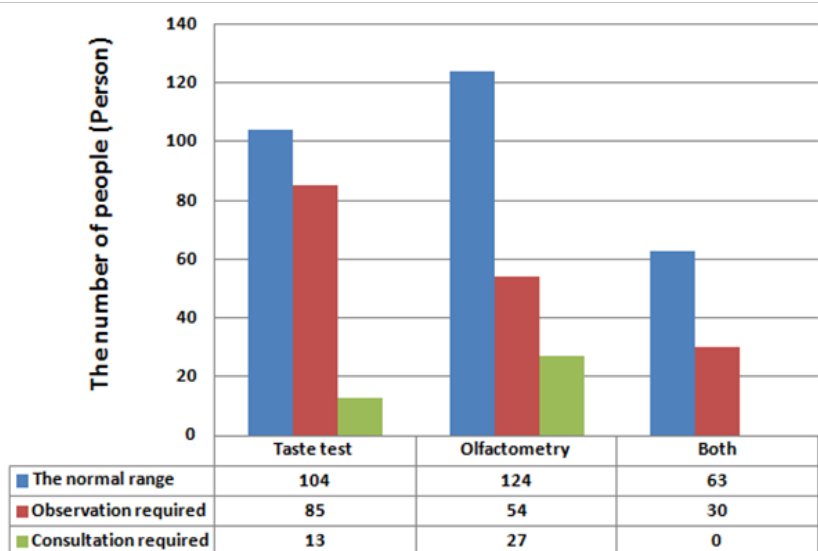


Figure 3 Taste and olfactory result of 206 Female.

## Discussion

There were a few male and a few female that taste and olfactory were normal together. In addition, the sense of smell declined with age. However, the taste had a small change by the aging.

## Conclusion

We inspected taste and sense of smell in Yakumo-cho inhabitant’s examination. A result, the sense of smell declined with age, but understood that the aging change of the taste was small. We want to weigh this result against eating habits findings in future.

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## Conflicts of interest

The author declares there is no conflicts of interest.

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