What can be expected from this technology

Using Nutritional approaches to help address the social issue of dementia associated with aging

The preservation of brain health is becoming a social issue

Appropriate measures for early prevention

Source: Statistics Bureau, Ministry of Internal Affairs and Communications

Source: Ninchisho Netto (Dementia Net)
About this technology

Focus on epidemiological reports that dairy intake reduces the risk of dementia

Relationship between consumption habits of fermented dairy products and cognitive function in old age (Hisayama Town Study)

<table>
<thead>
<tr>
<th>Dairy intake</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>More</td>
<td>1</td>
<td>0.64</td>
<td>0.56</td>
<td>0.63</td>
</tr>
</tbody>
</table>

Relative risk

Rate of change in blood BDNF concentration (%)

Clinical trial on MCI and Camembert cheese Blood BDNF results

J. Am. Geriatr Soci, 2014

About this technology

The preventive effect of Camembert cheese against dementia was first discovered in collaboration with the University of Tokyo.

Shed light on the relationship between Camembert cheese consumption and the onset of Alzheimer's disease.

Ano et al., PLoS ONE 2015
Camembert cheese can be fermented and aged with white mold and lactic acid bacteria. Ingredients that help improve cognitive function are produced during the fermentation process.

- Milk-based: Protein, Fat, etc.
- Lactic acid bacteria
- White mold

Ingredients produced:
- Peptides
- Fatty acids, etc.
About this technology

We have independently discovered a peptide that can improve cognitive function, and have developed a processing method that facilitates its intake.

We have independently discovered beta-lactolin — an active ingredient in dairy products that improves cognitive function.

We have established a manufacturing method for food ingredients that facilitates beta-lactolin intake.

Ano et al., Neurobiol. Aging 2018
About this technology

Improvement in cognitive function (memory/ability to pay attention and concentrate) confirmed in clinical trials

Improved performance in visual paired-associates test (memory recall)

- Number of correct answers increasing since week 0
- Bars represent means±SE, Placebo; N=53, Beta-lactolin; N=51
- p=0.021

Improved performance in cancellation and detection test (executive function)

- Difference in time required (seconds)
- p=0.024
- p=0.065
- Kita et al., Front Neurosci, 2019
### Uniqueness of this technique

Beta-lactolin exerts a positive effect on both memory and attention by reaching the brain and increasing neurotransmitter levels.

#### Comparison with other ingredients

<table>
<thead>
<tr>
<th>Ingredients involved</th>
<th>DHA</th>
<th>Ginkgo biloba</th>
<th>Beta-lactolin</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredients involved</td>
<td>DHA</td>
<td>Flavonoids Terpene lactones</td>
<td>GTWY(1.8 mg)</td>
<td>Since a small amount of beta-lactolin can produce a large effect, its use may be expanded to a wide range of food and beverages</td>
</tr>
<tr>
<td>Background research</td>
<td>Mediterranean cuisine</td>
<td>None</td>
<td>Epidemiology and Camembert</td>
<td>New functions discovered as a result of epidemiological research</td>
</tr>
<tr>
<td>Effectiveness (in humans)</td>
<td>Memory improvement, Limitation of neutral fat</td>
<td>Memory improvement</td>
<td>Memory improvement</td>
<td>Target ranges that can stimulate brain function are several</td>
</tr>
<tr>
<td>Mechanism of action</td>
<td>Hypermobility of cell membrane</td>
<td>Increased cerebral blood flow</td>
<td>Increased dopamin</td>
<td>Increases neurotransmitter dopamine, which directly regulates the improvement of cognitive function</td>
</tr>
<tr>
<td>Non-clinical evidence</td>
<td>Antioxidant, Anti-inflammatory Alzheimer’s disease prevention</td>
<td>Antioxidant</td>
<td>Prevention of Alzheimer’s disease, Anti-aging, Improvement of depression</td>
<td>May also potentially improve brain function</td>
</tr>
</tbody>
</table>

#### Background research

- Mediterranean cuisine
- None
- Epidemiology and Camembert

#### Effectiveness (in humans)

- Memory improvement
- Limitation of neutral fat
- Memory improvement
- Attention improvement
- Increased cerebral blood flow

#### Mechanism of action

- Hypermobility of cell membrane
- Increased cerebral blood flow
- Increased dopamin

#### Non-clinical evidence

- Antioxidant
- Prevention of Alzheimer’s disease, Anti-aging, Improvement of depression

#### Cognitive function

- Increased neurotransmitter levels (dopamine)
- MAO-B inhibition

#### Frontal lobe

- Directly to the brain

#### Hippocampus

- Peptide transporter

Reaches the brain and exerts its effect.
Achieve sustainable brain health support by combining nutrition with other solutions

Taking steps early on in the course of daily life will help preserve brain health

**Healthy brain**

**SCD** Subjective Cognitive decline

**MCI** Mild cognitive impairment

**MCI**

Taking steps early on in the course of daily life will help preserve brain health

**Knowledge of dementia**

Education

**Visualization of brain health**

Identification (early action)

**Visualization of brain health**

Realization effect (motivation)

**Connection with society/others**

**Cognitive training**

Brain training, Education

**Exercise**

**Daily diet**

A balanced diet

**Food and drink/supplements**

Future potential