

# BenTooth

- Functional food ingredient for gum health
- A complex of burdock root and other extracts

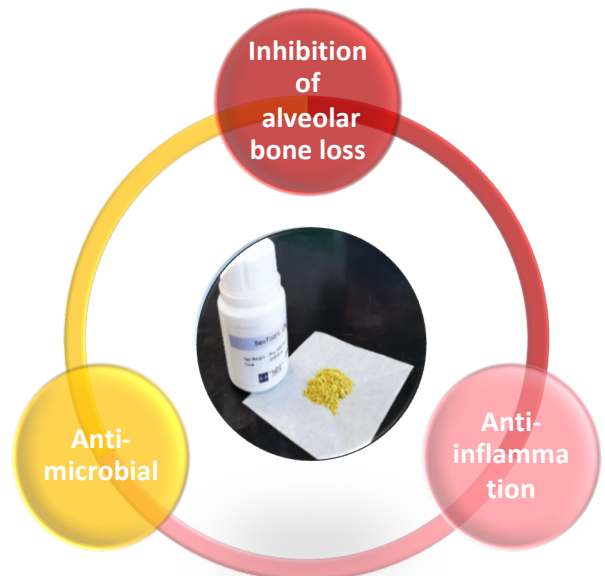


## Gum health

- Gum health has a great impact on the quality of our lives. Maintenance and management of gum health is important to healthy teeth.
- As we enter an aging society, the incidence of periodontal disease is increasing, resulting in increased consumer interest in healthy gums.

## Functional food ingredient for gum health

- BenTooth, a patented natural complex, is a 100% plant-derived ingredient that is rich in bioactive compounds such as polyphenols and flavonoids.
- We are developing it to establish itself as the best health functional food ingredient that can come to mind first in many people's minds when they hear 'gum health'.



## Efficacy evaluation according to health functional food (gum health) development guidelines

	Biomarker	Types of measurable research		
		<i>in vitro</i>	<i>in vivo</i>	Human
<b>Anti-oxidant</b>	Antioxidant enzyme activity (SOD, CAT, GPx, etc.)	○	○	○
	Radical scavenging activity ( <b>DPPH</b> , ORAC)	○	○	○
	DNA damage (Comet assay, 8-OH-dG, etc.)	○	○	○
<b>Anti-inflammatory</b>	IL-1β	○	○	○
	<b>IL-6</b>	○	○	○
	<b>TNF-α</b>	○	○	○
	hs-CRP	○	○	○
	Prostaglandins	○	○	○
<b>Anti-microbial</b>	Red complex ( <i>P. gingivalis</i> , <i>T. denticola</i> , <i>T. forsythia</i> )	○	○	○
	Orange complex ( <i>C. gracilis</i> , <i>C. rectus</i> , <i>F. nucleatum</i> , <i>P. micra</i> , <i>P. intermedia</i> , <i>P. nigrescens</i> )	○	○	○
	Green complex ( <i>A. actinomycetemcomitans</i> , <i>E. corrodens</i> )	○	○	○

	Biomarker	Types of measurable research			
		<i>in vitro</i>	<i>in vivo</i>	Human	
Changes of periodontal tissue and structure	Soft tissue	MMPs (MMP-3,8,9,13)	○	○	○
		TIMP-1	○	○	○
		Osteocalcin		○	○
	Hard tissue	RANKL	○	○	○
		Osteoprotegerin (OPG)		○	○
		C-telopeptide (CTX)		○	○
<b>Clinical Symptoms</b>	Alkaline phosphatase (ALP)		○	○	
	GI, gingival index			○	
	PI, plaque index			○	
	CAL, clinical attachment level			○	
	BOP, Bleeding on Probing			○	
	PD, probing depth			○	
	100mm VAS(Visual Analogue Scale)			○	
	<b>Gingival recession</b>		✓	○	
	<b>Alveolar bone loss</b>		✓	○	

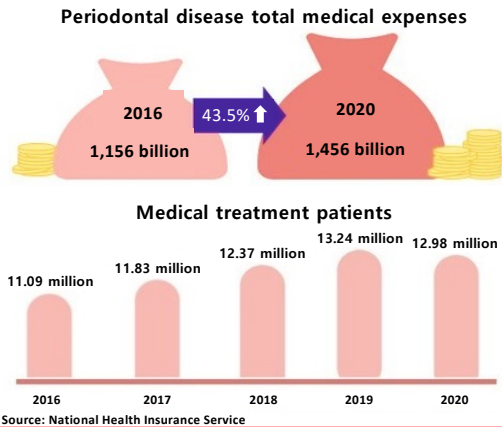
※ Items in red text have been evaluated for efficacy.

※ It was confirmed that it effectively inhibits the number of *S. mutans*, which is one of the biomarkers of health functional food (dental health).

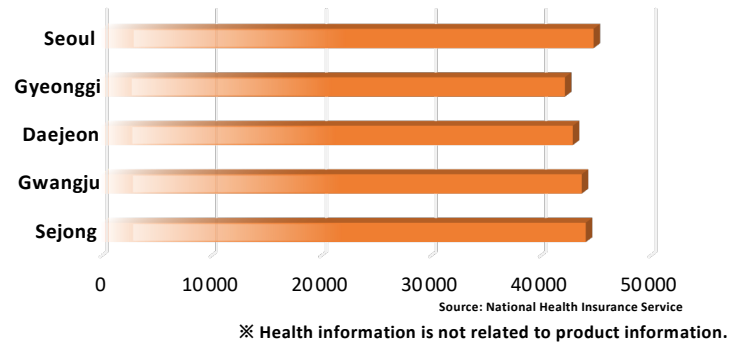


## Health Information for periodontal disease

### 2016-2020 Periodontal Disease Treatment Status

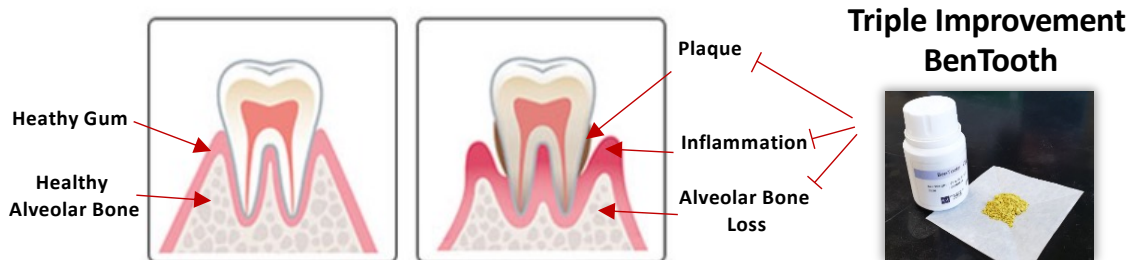


### NUMBER OF PATIENTS WITH PERIODONTAL DISEASE PER 100,000 PEOPLE



## Causes and symptoms of periodontal diseases

- ✓ It is caused by inflammation of the gums (gingivitis) and the long-term accumulation of plaque on the teeth and gums.
- ✓ The accumulation of plaque causes the gums to separate from the teeth, and periodontal pockets form.
- ✓ When plaque accumulates in the periodontal pocket, it promotes the growth of harmful bacteria, causing chronic inflammation and destroying the alveolar bone and periodontal ligament.
- ✓ Continued bad breath, bleeding gums or toothache symptoms appear.



## Reasons for the development of BenTooth

- ✓ Those who with swollen and bleeding gums
- ✓ Those who want to maintain healthy bones and teeth
- ✓ Those who want strong and healthy gums for implants
- ✓ Those who suffer from persistent bad breath
- ✓ Those who want to maintain healthy gums even after getting older

## Development stage of BenTooth (as of December 2022)

