What is BioApatite

Apatite（$Ca_{10}(PO_4)_6(OH)_2$）is a calcium phosphate compound found in bones and teeth. Minerals such as limestone are used as raw materials in its industrial production.
Our company uses calcium-containing discarded or unused resources as raw materials to produce **BioApatite**; one such resource is sanitarily managed **domestic chicken eggs**.

➢ Properties of BioApatite



1. Unused resource : discarded eggshells are used as the calcium-containing raw material
2. Safety : free of egg-derived allergens
3. Biocompatibility : contains eggshell-derived minerals
4. Adsorptivity : superior adsorptivity of colorants, heavy metal, *etc*.

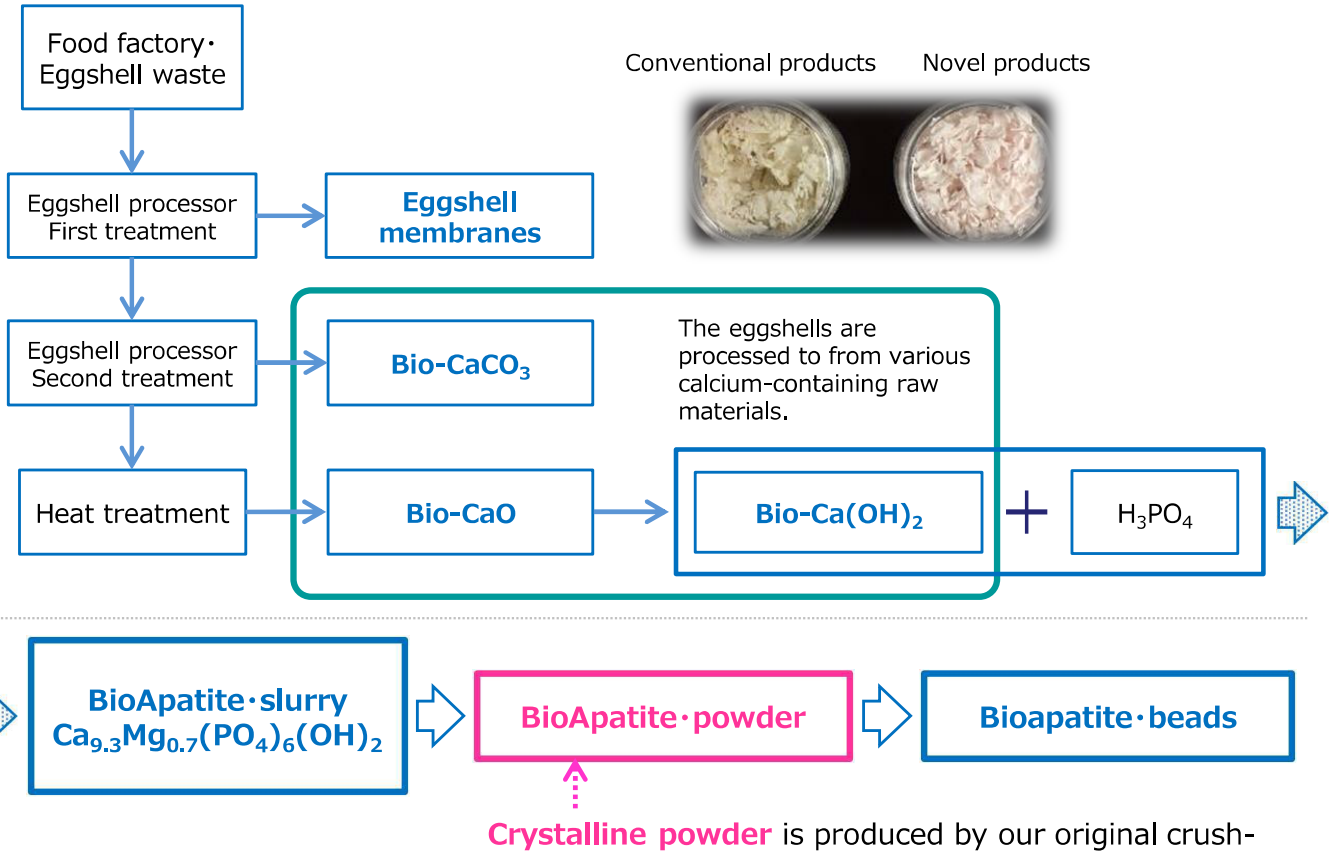
1 Unused resource



Discarded eggshells are the most significant unused calcium-containing resource.

Approximately **2,500,000 tons** of eggs are consumed in Japan each year, and about **250,000 tons** of eggshells are **discarded** as **animal residue** .

The **eggshell detachment device** (patent pending) I developed enables the easy **separation of the eggshell from the eggshell membrane**.



Crystalline powder is produced by our original crush-drying technology.

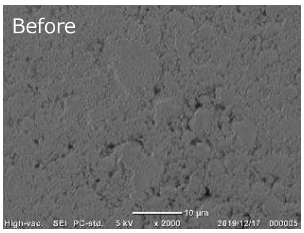
2 Safety

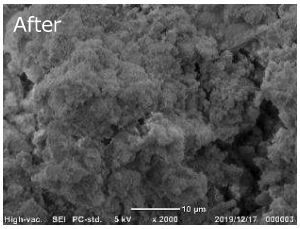
It has already been reported that eggshell is **not allergenic** when used as a raw material[1]. Allergenic egg material makes up less than 1.0 ppm of 1 g samples. Therefore, BioApatite has **low toxicity** , and will not be harmful to the human body. In addition, I confirmed that I meet an **unregulated drug raw materials standard** of a third-party organization.

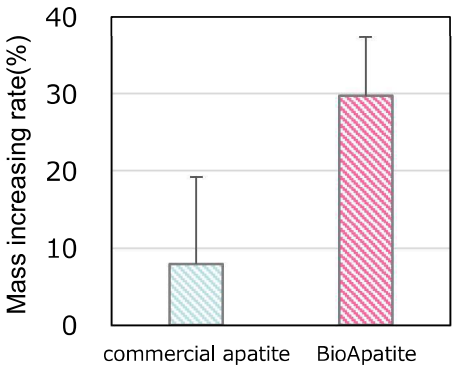
1) *Jan.J.Allergology*, **54**(5), 2005, 471-477

3 Biocompatibility

When evaluating biocompatibility using the change in mass of samples immersed in simulated body fluid (Hank's solution) for 24 h, BioApatite gained **3.7 times** more mass than commercial apatite*.







*commercial apatite is of mineral origin made by company W.

4 Adsorptivity

■ Colorants

Coffee

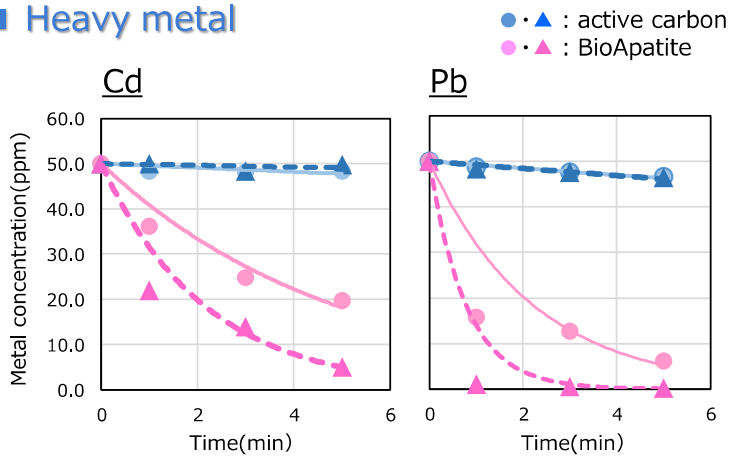


Red wine



Each sample weighing 2 g was added to an undiluted solution (50 mL), stirred, and left to stand for 5 min.
From the left: undiluted solution, calcium carbonate, commercial apatite, BioApatite.

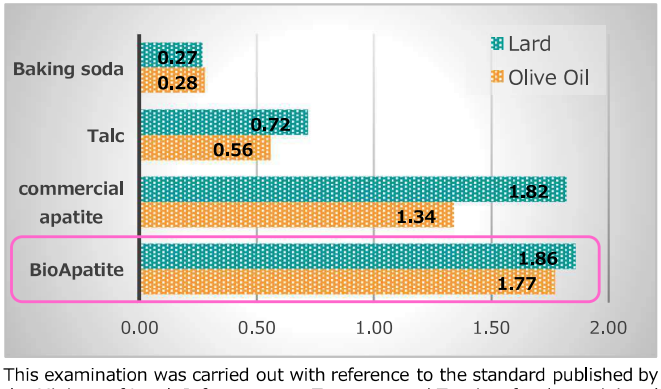
■ Heavy metal



Adsorption at ●:20 ℃,▲:60℃
BioApatite showed **superior adsorption at higher temperature.**

■ Fat and Oil

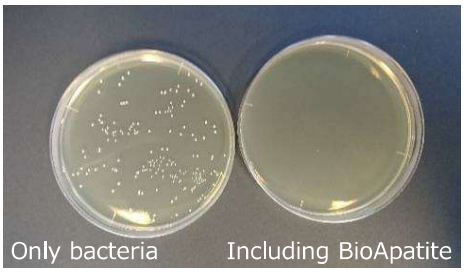
Amount adsorbed (mL) per 1 g of sample.



This examination was carried out with reference to the standard published by the Ministry of Land, Infrastructure, Transport and Tourism for determining the rate of oil adsorption by oil-adsorbing materials.

■ Bacteria

BioApatite adsorbs caries pathogens*.
It is also superior for the adsorption of other oral bacteria.



S.mutans MT8148 After 48h culture

**S.mutans* GS5,*S.mutans* UA159 *etc.*

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