Anti-Obesity Material

UNIFETH®

UNIFETH is universal ingredient for health. UNIFETH contains an active ingredient called phytostenone (JP PATPEND, examination request). TOYO HAKKO manufactures phytostenone by our original fermentation technique (JP PATPEND).

Characteristics of UNIFETH

- Phytostenone significantly reduce visceral fat and relieve obesity.
- Phytostenone has two effects, beta-oxidation increase effect and fat transfer inhibition effect.
- Phytostenone has good lipid solubility, you can have better effect by taking it with fat.

Method of manufacturing

Phytosterol

\[
\text{Fermentation} \quad \rightarrow \quad \text{Phytosterol} \quad \rightarrow \quad \text{Phytostenone}
\]

UNIFETH®

Quality Specification

<table>
<thead>
<tr>
<th>Trade name</th>
<th>UNIFETH®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic name</td>
<td>Phytosterol fermenting substance</td>
</tr>
<tr>
<td>Total Phytostenones</td>
<td>More than 35%</td>
</tr>
<tr>
<td>Appearance</td>
<td>White to slightly yellow powder</td>
</tr>
<tr>
<td>Use-by date</td>
<td>30-120mg/day</td>
</tr>
<tr>
<td>Number of viable cells</td>
<td>Not more than 3000 cfu/g</td>
</tr>
<tr>
<td>Coliform group</td>
<td>Negative</td>
</tr>
<tr>
<td>Fungi/Yeast</td>
<td>Not more than 300 cfu/g</td>
</tr>
<tr>
<td>Heavy metals(as Pb)</td>
<td>Not more than 20ppm</td>
</tr>
<tr>
<td>Arsenic (as As₂O₃)</td>
<td>Not more than 2ppm</td>
</tr>
</tbody>
</table>

A part of raw materials of UNIFETH® is soy bean-derived.

“UNIFETH” is the registered trademark of TOYO HAKKO CO.,LTD.

Our company is certified for ISO 9001
Anti-Obesity Material

UNIFETH® Effect Test

Effect Test

Effect of UNIFETH® in body weights gain
High fat diet with the addition of 0.5% UNIFETH® fed group showed more significant repression in body weights gain than the high fat control group. And body weights of them after 8 weeks were similar to those of the normal control group.

Effect of UNIFETH® in body fat
High fat diet with the addition of 0.5% UNIFETH® fed group showed significant reduction in weights of visceral fat and subcutaneous fat after 8 weeks.

Action Mechanism of UNIFETH®
UNIFETH® enhances fat metabolism

<table>
<thead>
<tr>
<th>Food (including fat)</th>
<th>Inside Liver</th>
<th>Fatty acid</th>
<th>Fat accumulation</th>
<th>Fat mobilization</th>
<th>Fat cell</th>
<th>Acetyl-CoA</th>
<th>Energy</th>
<th>Citric acid cycle</th>
</tr>
</thead>
</table>

UNIFETH® Inhibits transfer of fat

Inside intestine

Intestinal wall

Lymph nodes

UNIFETH® inhibits transfer of fat

Chylomicron synthesis inhibition

UNIFETH®

Fat

No absorption and excretion

Safety Test

- It is heard that plants, especially Cattail 1, contain phytostenone, but all of plants contains a little bit. Therefore we carried out the safety tests in accordance with the guideline of Ministry of Health, Labour and Welfare. 1 Cattail grow gregariously around swamps and ponds. It is cultivated in Chikugo-River basin of Saga Prefecture in Japan.
- Single dose oral toxicity test LD50: More than 2,000mg/kg
- 1 week continuous administration (rats: male/female) 1,000mg/kg/day: Nothing abnormal detected on performance status, body weight, urinary test, blood biochemical examination, organ weight and necropsy
- Genotoxicity test
  - Mutagenicity test (5 bacterial species) and Chromosomal aberration test: Negative
  - Multiple oral administration (mouse / male) 1,250mg/kg/day: Nothing abnormal detected on performance status, body weight, blood biochemical examination, excretion test and organ weight

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