Optimise childrens learning with Lacprodan® PL-20

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Boost children’s IQ-potential with Lacprodan® PL-20

The potential of a person to learn will never be greater than during childhood and adolescence. Two very important periods in life where the brain continues to develop and mature (box 1) and has higher needs for special nutrients like choline, phospholipids and gangliosides\(^1,2\).

Lacprodan® PL-20 is a milk protein concentrate rich in choline and phospholipids. Lacprodan® PL-20 provides phospholipids with a profile that perfectly matches the profile of the young human brain contrary to dietary sources like egg and soy (figure 1).

Optimise children’s learning potential with choline and phospholipids from Lacprodan® PL-20

- Choline is critical for normal brain development
- Choline is essential for memory function
- Phospholipids are needed for optimal brain development

Box 1

Childhood and adolescence – Brain under construction!

The brain continues to develop and mature throughout childhood and adolescence\(^1\). The extent of connections formed between different parts of the brain during these periods are related to growth in intellectual capacities such as memory and reading ability.

The brain regions most relevant for problem solving, reasoning, self-regulation, personality and strategic functioning have a maturational course spanning the entire school age and extending into adulthood\(^19,20\). This maturational course is complex and involves a range of processes including neurogenesis, synaptogenesis and myelination (outlined below).

<table>
<thead>
<tr>
<th>Process</th>
<th>Results</th>
<th>Supporting Lacprodan® PL-20 lipid component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurogenesis</td>
<td>Nerve cells are formed</td>
<td>All phospholipids</td>
</tr>
<tr>
<td>Synaptogenesis</td>
<td>Formation of neural connections</td>
<td>All phospholipids</td>
</tr>
<tr>
<td>Synaptogenesis</td>
<td></td>
<td>(figure 1)</td>
</tr>
<tr>
<td>Myelination</td>
<td>Nerve cells are wrapped in myelin which greatly increases the speed of impulses</td>
<td>Sphingomyelin (SM) and phosphatidyl-choline (PC) i.e., choline containing compounds</td>
</tr>
</tbody>
</table>

Figure 1 Distribution of phospholipids

![Figure 1 Distribution of phospholipids](image)
Choline is essential for normal brain development and memory function
Choline is critical for synthesis of acetylcholine, a neurotransmitter important for brain functions such as memory and mood. But also important in skeletal-muscle control, heart rate and breathing. Numerous animal studies demonstrate that choline is necessary for development of the memory function. Suboptimal dietary intake of choline affects brain development and results in permanent changes in brain function.

It is evident that availability of choline during sensitive periods of brain development influences cognitive performance in adulthood and old age, which emphasizes the importance of getting sufficient dietary choline during early childhood.

Studies have shown that oral supplemental choline ingested by young individuals produced a significant increase in choline-containing compounds in the brain, and research suggest that it can possibly reverse abnormal neuropsychological development in children.

Choline is needed for optimal health
Getting adequate choline in the diet throughout life is important for sustaining optimal health. The recommended daily adequate intake (AI) of choline varies according to age (table 1). Less than 25% of the general population achieve the recommended daily intake and the established requirements seem insufficient for subsets of the population.

<table>
<thead>
<tr>
<th>Population</th>
<th>Age</th>
<th>AI choline (mg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children</td>
<td>1–3</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>4–8</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>9–13</td>
<td>375</td>
</tr>
<tr>
<td>Adolescents</td>
<td>14–18</td>
<td>550</td>
</tr>
<tr>
<td></td>
<td>14–18</td>
<td>400</td>
</tr>
<tr>
<td>Adults</td>
<td>&gt; 19</td>
<td>550</td>
</tr>
<tr>
<td></td>
<td>&gt; 19</td>
<td>425</td>
</tr>
</tbody>
</table>

Permitted health claims for choline
“Choline contributes to normal lipid metabolism”
“Choline contributes to the maintenance of normal liver function”
“Choline contributes to normal homocysteine metabolism”

Lacprodan® PL-20 supports the developing brain
Lacprodan® PL-20 is rich in lipids needed to support developmental and maturational processes in brains of children and adolescents.

Lacprodan® PL-20 is ideal as a natural (non-synthetic) source of choline and phosphatidylserine. Furthermore, it provides a unique opportunity to deliver other biological important lipids such as the sialic acid containing gangliosides, documented to improve cognitive performance, and sphingomyelin (SM) needed for myelination processes during brain and cognitive development.

Human intervention trials have documented Lacprodan® PL-20 as an enhancer of cognitive performance and working memory in adults.

Lacprodan® PL-20 is
› A natural non-synthetic source of choline (800 mg/100g)
› A natural and good tasting source of phosphatidylserine (PS) (1.9 g/100g)
› A milk protein concentrate rich in phospholipids (min 16g/100g), with a similar profile as found in the human brain
Recommended dosage
A daily dosage of 16 g Lacprodan® PL-20 supply 50% of AI for choline for children aged 4-8 years and provides 300 mg of phosphatidylserine (PS).

Application
Lacprodan PL-20 is UHT stable and can be successfully incorporated into a wide variety of applications, including milky beverages, yoghurts, chilled and frozen desserts and confectionary.

REFERENCES
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