Preventing protein malnutrition
with Lacprodan®
Protein is vital for the human body. It provides the body with the necessary foundation to preserve and build vital tissues and muscle mass and keeping the body in protein balance.

An adequate intake of protein is paramount whether it is to stay healthy, to recover from illness or to reduce protein malnutrition. When struck by illness or disease the body needs more protein to recover. The protein requirements double from 0.8 g/kg bw/d to up to 1.5 g/kg bw/d.

**A challenge calling for action**
Protein malnutrition is a growing challenge among elderly in general and elderly with chronic diseases in particular. It affects morbidity and mortality in a number of ways and results in decreasing quality of life for the elderly and increasing health care costs for the community.

Generally, protein malnutrition among hospital patients is estimated to be 20-50%. A UK survey has shown that 42% of the residents in home care were at risk of malnutrition.

**Extensive and expensive consequences**
Protein malnutrition among the elderly may be caused by a continuous dietary protein intake below the Recommended Dietary Allowance (RDA).

The consequences are extensive; reduction of immune response and causing delay when healing wounds. The elderly are particularly vulnerable e.g. when rehabilitating from different fractures, suffering from chronic renal failure and multiple other disorders.

Besides the overall complications the protein malnutrition is likely to result in more and longer stays in the hospital. Thus, growing expenses regarding treatment is another effect. It has been estimated that the minimum cost of malnutrition is an annual £7.3 billion in the UK. That amount is twice the size of the reported spendings to manage obesity and its consequences in the UK.

**Whey is a documented option**
Whey is considered one of the highest quality dietary proteins (see table 1). The amino acid profile in whey

<table>
<thead>
<tr>
<th>Protein source</th>
<th>Biological value</th>
<th>Net Protein Utilisation</th>
<th>PDCAAS (Acc. FAO/WHO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whey</td>
<td>104</td>
<td>92</td>
<td>1.00</td>
</tr>
<tr>
<td>Cow’s milk</td>
<td>91</td>
<td>87</td>
<td>1.00</td>
</tr>
<tr>
<td>Casein</td>
<td>77</td>
<td>76</td>
<td>1.00</td>
</tr>
<tr>
<td>Soy protein</td>
<td>74</td>
<td>70</td>
<td>0.91</td>
</tr>
<tr>
<td>Whole egg</td>
<td>100</td>
<td>98</td>
<td>1.00</td>
</tr>
<tr>
<td>Beef</td>
<td>80</td>
<td>78</td>
<td>0.92</td>
</tr>
</tbody>
</table>

Table 1  Nutritional value of key proteins

PDCAAS, Protein Digestibility Corrected Amino Acid Score, EDA1997
proteins covers or even exceeds the human requirements for essential amino acids according to the requirements set by the Food and Agriculture Organisation/World Health Organisation FAO/WHO.

Lacprodan® is part of the solution
Arla Foods Ingredients provides high quality Lacprodan® whey proteins suitable to help prevent protein malnutrition (see table 2).

Research
Oral nutritional supplements high in protein may reduce the number of complications in elderly patients regarding infections, poor healing of wounds and fractures, leg and pressure ulcers compared to a control routine care⁸. A high protein oral nutritional supplement may also improve nutritional intake, weight and muscle tissue compared to a control routine care⁹.

Two fermented clinical nutrition drinks were compared regarding total intake and protein intake in a three-day clinical study¹⁰. A standard fermented clinical nutrition drink with a total protein content of 5.7% was used as a reference and compared to a high protein fermented clinical nutrition drink added whey protein isolate (Lacprodan® DI-9224) with a total protein content of 10.2%. The patients found the drink containing Lacprodan® DI-9224 more appetite stimulating than the reference due to a less fatty taste and a stronger fruit flavour. Thus, the drink containing Lacprodan® DI-9224 resulted in a trend towards a higher compliance and a significantly higher protein intake (see figure 1 and 2).

Table 2  Facts on Lacprodan®

<table>
<thead>
<tr>
<th>Lacprodan®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whey protein concentrate</td>
</tr>
<tr>
<td>Whey protein isolate</td>
</tr>
<tr>
<td>Whey protein hydrolysate</td>
</tr>
<tr>
<td>Whey fractions</td>
</tr>
</tbody>
</table>

Figure 1
Total intake of clinical nutrition drinks (g) during a three-day period.

Control | Lacprodan® DI-9224
---|---
400 | 1200
600 | 1000
800 | 800
1000 | 600
1200 | 400
1400 | 200

Figure 2
Total protein (g) intake after consumption of clinical nutrition drinks during a three-day period.

Control | Lacprodan® DI-9224
---|---
20 | 140
40 | 120
60 | 100
80 | 80
100 | 60
120 | 40
140 | 20

Recommended dosage
The level of dietary protein needed to preserve body protein mass is recommended to be 1.5 g/kg bw/d in patients in general and 1.2 g/kg bw/d in intensive care unit patients⁶.

Application
The Lacprodan® product range can be applied in beverages, some even in clear beverages containing up to 10% protein. The products can also be incorporated in food solutions with a protein content up to 30%. Lacprodan® can also be added directly to milk or water when shaken thoroughly to obtain homogenous distribution before consumption.

Conclusion
Disease-related protein malnutrition may be prevented by increased dietary intake of Lacprodan® whey proteins. This will improve the recovery rate and help reduce the length of hospital stays and thereby reduce the overall economic costs. Additionally, Lacprodan® DI-9224 has been seen to improve the total intake and increase the protein intake when used as an addition and supplement to a standard clinical nutrition drink.
References