Pellagra is a niacin deficiency. This is no longer a common deficiency in developed countries, but was in the U.S. in the early 1900s. This was because corn was a staple crop, meaning it was what people primarily consumed. The bioavailability of niacin from corn is poor unless treated with a base to release the bound niacin. The symptoms of pellagra are the 3 D's:

Dementia
Dermatitis
Diarrhea

Some refer to 4 D's in which the 4th D is death if the condition is not managed. The following pictures show the symptoms of pellagra.

Figure 9.521 The 3 D's of pellagra

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1. Image source or reference
Dietary niacin toxicity is rare. However, nicotinic acid (not nicotinamide) can improve people's lipid profiles when consumed at levels far above the RDA. For instance the RDA & upper limit (UL) is 14 or 16 (women & men) and 35 mg (both), respectively. Many people are taking 1-2 grams (up to 6 g/day) to get the benefits in their plasma lipid profiles as shown in the table below\textsuperscript{4,5}.

Table 9.521 Effects of nicotinic acid (>1.5 g/day) on plasma lipid profile\textsuperscript{3}

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>VLDL</td>
<td>$\downarrow$ 25-40%</td>
<td></td>
</tr>
<tr>
<td>LDL</td>
<td>$\downarrow$ 6-22%</td>
<td></td>
</tr>
<tr>
<td>HDL</td>
<td>$\uparrow$ 18-35%</td>
<td></td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>$\downarrow$ 21-44%</td>
<td></td>
</tr>
<tr>
<td>Triglycerides</td>
<td>$\downarrow$ 21-44%</td>
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</tbody>
</table>

It should be pointed out that there are special supplements for this purpose that include a slower release nicotinic acid that helps prevent the toxicity symptoms (nicotinamide isn't toxic).
A slow release form of niacin for people with atherosclerosis is Niaspan®. The links below are to its general site and to one for health care professionals.

A recent study found that Niaspan plus a statin was no better than a statin alone in preventing heart attacks, despite improvements in HDL and triglyceride levels. This result is challenging our understanding of the importance of HDL and triglyceride levels to heart attack risk. The link below explains this study's results.

The most well known of the toxicity symptoms is "niacin flush", which is a dilation of capillaries accompanied by tingling that can become painful. This symptom is noted to occur at lower levels than the other toxicity symptoms. Other symptoms include:

- Gastrointestinal Distress
- Liver Damage

A nicotinic acid receptor (HM74A or GPR109A) has been identified that is believed to mediate the beneficial effects of nicotinic acid on people's lipid profiles and the toxic side effects.

References & Links

Links
Pellagra - http://www.pathguy.com/lectures/mcgill_pellagra.jpg
Niaspan® - http://www.niaspan.com/
Niaspan® Health Care Professional's Site - http://www.niaspanpro.com/