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**PRODUCTION OF PKC IN MALAYSIA**

The palm kernels are crushed to yield palm kernel oil and PKC. The yield of PKC is 50%. Since 1996, Malaysia has been producing more than 1.3 million tonnes of PKC annually (Table 1). Most of the PKC produced is exported, especially to Europe for use as an ingredient in animal feed formulations.

The European Union (EU) countries absorb more than 85% of Malaysian PKC annually and the Netherlands is the biggest importer of Malaysian PKC among the EU countries (Table 2). Asian countries which import Malaysian PKC are South Korea and Japan. In 2000, approximately 1.1 million tonnes or 90% of Malaysian PKC exports to the EU were taken by the Netherlands (Table 3).

**PKC COMPOSITION**

There are two types of PKC depending on the process to get it, *i.e.* either through mechanical or...
TABLE 3. MALAYSIAN EXPORT OF PKC TO EU COUNTRIES (t)

<table>
<thead>
<tr>
<th>Country</th>
<th>1997</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3 304</td>
<td>0</td>
</tr>
<tr>
<td>Germany</td>
<td>29 762</td>
<td>44 910</td>
<td>28 610</td>
<td>104 083</td>
<td>33 542</td>
</tr>
<tr>
<td>Ireland</td>
<td>16 795</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Italy</td>
<td>0</td>
<td>4 199</td>
<td>0</td>
<td>0</td>
<td>5 000</td>
</tr>
<tr>
<td>Netherlands</td>
<td>863 986</td>
<td>895 714</td>
<td>1 034 376</td>
<td>1 097 933</td>
<td>535 728</td>
</tr>
<tr>
<td>Portugal</td>
<td>0</td>
<td>5 882</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Spain</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9 377</td>
<td>35 128</td>
</tr>
<tr>
<td>U. Kingdom</td>
<td>88 207</td>
<td>14 365</td>
<td>0</td>
<td>0</td>
<td>6 005</td>
</tr>
<tr>
<td>Total</td>
<td>998 749</td>
<td>965 070</td>
<td>1 062 986</td>
<td>1 214 698</td>
<td>615 404</td>
</tr>
</tbody>
</table>

Note: *January - May.
Sources: PORLA (1999); MPOB (2000).

TABLE 4. MINERAL CONTENT IN PKC

<table>
<thead>
<tr>
<th>Mineral Composition</th>
<th>Calcium, %</th>
<th>Phosphorus, %</th>
<th>Magnesium, %</th>
<th>Iron, mg kg⁻¹</th>
<th>Copper, mg kg⁻¹</th>
<th>Zinc, mg kg⁻¹</th>
<th>Manganese, mg kg⁻¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.29</td>
<td>0.79</td>
<td>0.27</td>
<td>4.05</td>
<td>28.5</td>
<td>77.0</td>
<td>225.0</td>
</tr>
</tbody>
</table>

Source: Extracted from Yeong et al. (1983).

Malaysian Palm Kernel Cake as Animal Feed

The fat content makes PKC an energy feed. PKC also contains approximately 16% fibre. Fibre is considered an essential nutrient for dairy cattle, since cattle fed insufficient fibre often develop metabolic or digestive problems (Miller and O’Dell, 1969). About 17% crude fibre, on a dry basis, is enough to prevent adverse effects of a deficiency for lactating cows (NRC, 1978).

The high phosphorus to calcium ratio in the PKC makes it a good choice to be used for dairy cow feed. These two elements are critical nutrients in the feed, not only as the major elements forming the mineral bases of bones and teeth, but also as the key minerals required in biochemical energy transformation in all body cells. Other elements such as magnesium, copper, zinc and iron, which are essential to animals are also available in PKC (Table 4).

USE OF PKC IN CATTLE FEED FORMULATIONS

PKC is a useful source of protein and energy for livestock and it is commonly used in animal feed especially for ruminants (Hutagalung, 1981). Almost all exported Malaysian PKC is used in dairy cow feed (Osman, 1986). PKC is used as a common ingredient in German and Dutch with dairy ration approximately 10% of the cake in the ration, whereas in Malaysia, dairy farmers
use more than 50% (Osman and Hisamuddin, 1999).

The biological value of PKC is 61%-80% for sheep (Devendra, 1978). Feeding palm kernel-based diets to dairy cows has been shown to increase the milkfat content, enhance the firmness of butter and produce good quality meat (Witt, 1952; Morrison, 1956). The milk of dairy cattle fed with PKC tends to increase the milkfat content, especially in the EU. Its nutritional value, attractive prices compared to other meals and long-term availability make PKC more competitive in international meal market.

CONCLUSION

PKC has been accepted as one of the components in animal feeds, especially in the EU. Its nutritional value, attractive prices compared to other meals and long-term availability make PKC more competitive in international meal market.

REFERENCES


