INTRODUCTION

In September 2000, LMC International published the eighth in a series of studies analyzing sugar and HFCS production costs. In this study, costs are estimated over a 20-year period, from 1979/80 through 1998/99, for a total of 120 countries.

This paper presents a preview of the results. It focuses on the international cost competitiveness of the US sugar and HFCS industries. It also contrasts the costs of producing sugar and HFCS in the US with those of Australia, the European Union and Japan, which together account for the overwhelming majority of sweeteners that are produced in industrialized countries, where wages and environmental regulations can be compared on a more equal basis.

KEY DETERMINANTS OF INTERNATIONAL COST COMPETITIVENESS

When one thinks of the determinants of the costs of producing sugar or HFCS (or any other good), one tends to think of costs being determined by two principal factors:

1. The quantity of inputs - such as labor, fuel, machinery, etc. (and corn in the case of HFCS) used to produce one ton of sugar or HFCS; and
2. The price of each of these inputs.

However, when it comes to comparing costs internationally, they must be expressed in a common unit of currency. Typically, this is the US dollar. This introduces another, and often very influential, determinant of an industry's cost competitiveness: the value of its currency against the US dollar.

One can be excused for thinking that a dollar is worth a dollar; for US-based producers, the international benchmark currency is after all their own currency. However, to almost everyone else in the world, this is not the case. What is more, in almost all countries around the world, the US dollar is currently perceived as being very expensive. This has very important implications for the international cost competitiveness of US industries, because a strong dollar acts to inflate that value of US costs relative to other countries', irrespective of whether or not the industry has managed to lower its own costs.

Viewed over the 20 year period over which we have prepared cost estimates, the dollar's value has increased by approximately two thirds against a basket of the world's cane sugar producers' currencies, providing these producers with a considerable competitive advantage over US producers. The story is less clear-cut for the beet sugar sector. After a period of considerable strength in the mid 1980s, the dollar weakened markedly, but has but has since strengthened again, hampering the US beet sector's international cost competitiveness. Over the full 20 year period, however, the dollar has gained almost one third against a currency basket of world's beet sugar producers. The sector whose cost competitiveness has been least affected by currency movements is the HFCS industry. The reason for this is that the dollar dominates the basket of fructose producers, because it accounts for such a large share of world fructose production.
INCREASING SAMPLE SIZE

Since LMC prepared its last cost study, we have increased the number of countries in our survey by 10, to 120; since our first cost study, the number of countries has increased by almost 20. This means that US sugar and HFCS producers face a sterner test to maintain, or improve, their place in our cost rankings. The US beet sector is now contrasted with 39 beet sugar industries; the cane industry with 62 other producers; and the wet milling industry with 18 other fructose producers.

RESULTS

The Global Picture

Diagram 1 compares US production costs for the beet, cane and HFCS sectors with the world average for sugar (i.e., beet and cane). In the diagram, costs are expressed as a percentage of the world average for sugar in the first five-year period of our analysis, 1979/80-1983/84. By presenting costs in this way, it is possible to see how US production costs compare with the world average and how they have changed over time.

Diagram 1: US Production Costs as a Percentage of Average World Sugar (Beet & Cane) Production Costs

In order to compare the US cane sugar industry, which produces raw sugar, with the beet and HFCS industries, which produce white sugar (or, in the case of HFCS 55, an equivalent product when expressed on a dry basis), we first convert our raw sugar production cost estimates to a white sugar equivalent basis by multiplying by the adjustment factor of 1.087, and then add US$65 as an allowance for the cost of refining.

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Two features of this diagram stand out:

1. US sugar and HFCS production costs are at, or below, the world average for sugar throughout our survey period (with the brief exception of cane sugar in the first of our five-year period). This is most noticeable in the HFCS sector.

2. US production costs in the most recent five-year period of our analysis were below those in the first period in all three sweetener sectors.

In Tables 1 and 2, we present the international cost rankings of each US sector in four consecutive five-year periods. The key features of Table 1 are:

1. All three sectors of the US sweetener industry have risen in the international cost rankings over the period since LMC began its international costs analysis.

2. By the most recent five-year period covered in our new study, the beet and HFCS industries had maintained their exceptionally high international rankings, standing 2nd and 1st, respectively, within their sectors.

3. Even the cane sector, which has to compete with cane industries in some of the poorest nations in the world (where wages are generally very low, environmental regulations tend to be far less stringent than in the US, and where a great many producers have benefited from favorable exchange rate movements), is ranked 26th out of a total of 63 cane sugar producers in the final five years of our survey period.

Table 1: International Cost Ranking of US Beet, Cane and HFCS Producers

<table>
<thead>
<tr>
<th>Year</th>
<th>US Beet US Rank</th>
<th>Out of</th>
<th>US Cane US Rank</th>
<th>Out of</th>
<th>US HFCS (55) US Rank</th>
<th>Out of</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979/80-1983/84</td>
<td>10</td>
<td>31</td>
<td>39</td>
<td>60</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>1989/90-1993/94</td>
<td>2</td>
<td>36</td>
<td>38</td>
<td>62</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>1994/95-1998/99</td>
<td>2</td>
<td>40</td>
<td>26</td>
<td>63</td>
<td>1</td>
<td>19</td>
</tr>
</tbody>
</table>

Table 2 reveals how US sugar (i.e., beet and cane) and sweetener (i.e., beet, cane and HFCS) producers have maintained their position in our international rankings, despite the greater number of producers included in our survey, and the competitive disadvantage caused by the strengthening of the US dollar during our most recent five-year period. Indeed, beet and cane sugar producers, as a group, have increased their international ranking in each successive five-year period, and now rank within the top 30 (out of a total of 102 producers). Adding in the very cost competitive HFCS industry lifts the combined US sweetener sector into the top-20 (out of 120 countries).
Table 2: International Cost Ranking of US Sugar and Sweetener Producers

<table>
<thead>
<tr>
<th></th>
<th>US Beet &amp; Cane</th>
<th>All US Sweeteners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>US Rank</td>
<td>Out of</td>
</tr>
<tr>
<td>1979/80-1983/84</td>
<td>41</td>
<td>90</td>
</tr>
<tr>
<td>1984/85-1988/89</td>
<td>38</td>
<td>93</td>
</tr>
<tr>
<td>1989/90-1993/94</td>
<td>31</td>
<td>97</td>
</tr>
<tr>
<td>1994/95-1998/99</td>
<td>28</td>
<td>102</td>
</tr>
</tbody>
</table>

The US vs. Other Industrialized Countries

The three diagrams that follow contrast beet sugar, cane sugar and HFCS production costs in the US, Australia, the European Union and Japan with the world average sugar and HFCS production costs.

The first of these diagrams (Diagram 2) compares beet sugar production costs in the US, the European Union and Japan with the world average for sugar, i.e., the world average of both beet and cane sugar. Australia is not included in this diagram, because it does not produce beet sugar.

Diagram 2: US, European Union and Japanese Beet Sugar Production Costs as a Percentage of Average World Sugar Production Costs in the Same Period

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This diagram reveals that the US beet industry is the only one of these industries whose costs currently lie below the world average of beet and cane sugar production costs. In the latest five-year period covered, the US beet industry's costs stood at approximately 95% of the world average. This compared with 125% for the European Union and 235% for Japan.

The second of these diagrams (Diagram 3) repeats this exercise for cane sugar, comparing production costs in the US, Japan and Australia once more with the world average for sugar, i.e., the world average of both beet and cane sugar. This time the European Union is excluded from the diagram, because it only produces small quantities of cane sugar in its overseas dependencies.

This diagram reveals that the US cane industry's costs have declined from close to the world average at the start of our survey period to approximately 90% of the world average in the last five-year period.

By contrast, Japan's costs have risen massively over time. Meanwhile, Australia has maintained its position as one of the world's lowest cost cane sugar producing countries, with costs standing at around 60% of the world average for beet and cane sugar.

Finally, Diagram 4 compares production costs for HFCS 55 in the US, the European Union and Japan with the world average for HFCS. Australia is, once again, excluded from this diagram, because it produces negligible quantities of HFCS. This diagram highlights the US HFCS industry's massive cost advantage against the European Union and Japan.

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Cost Curves

Another way in which international cost comparisons can be presented is by preparing cost curves, which combine in one diagram each country’s production cost and the level of its sugar output. We have prepared two such cost curves, one of which compares the combined position of the US beet and cane sugar sectors, and another which compares the combined position of the US beet sugar, cane sugar and HFCS sectors.

To derive a cost curve, one first ranks all producers in terms of their production costs, beginning with the lowest cost producer, then moving to the second lowest cost producer, the third lowest cost producer and so on, all the way up to the highest cost producer. Against each producer, one records its level of sugar or HFCS output.

From the cost curve that emerges from this process, it is possible to determine how much sugar output worldwide can be produced at, or below, a certain production cost. For example, if the ten lowest cost sugar producers in the world have a combined sugar output of 15 million metric tons, and their costs range from US$200 per metric ton for the lowest to US$250 per metric ton for the highest, then one knows that the producers of these 15 million tons of sugar can cover their costs at a sugar price of US$250 per metric ton.

The first of the two costs curves (Diagram 5) combines the costs and output of a total of 102 sugar producing industries. Included in this diagram is the world average cost for all sugar producers, which is represented by the thick horizontal line. For the purposes of comparison, we have fixed this cost at 100, with the costs for all countries expressed as an index value relative to this world average cost.
The diagram also includes a shaded bar, which depicts the position of the US sugar industry (beet and cane combined) on this cost curve. This reveals that the average cost of sugar production in the US is just below the world average and that around one half of world sugar output is produced at a lower cost than in the US.

The final diagram (Diagram 6) combines all three of the US sweetener sectors — beet sugar, cane sugar and HFCS — and placed them within a cost curve made up 120 sugar and sweetener producers around the world.

By including the low cost US HFCS industry in this analysis, the US’s international cost competitiveness appears even more favorable. Based on the average cost of producing all three sweeteners in the US, the US ranks among the lowest cost sweetener producers in the world, with only around 40% of total world sweetener output being produced at a lower cost than the US average for all three sweeteners.
CONCLUSIONS

The second half of the 1990s presented the US sweetener industry with a stern test of its ability to remain internationally cost competitive. Perhaps the greatest of these has been the strengthening of the US dollar, which is beyond the control of domestic producers. Nevertheless, the industry has shown itself equal to the challenge, maintaining its international ranking as a sugar and sweetener producer.