ABSTRACT

There is concern that orange juice from foreign countries may contain residues of pesticides not allowed in the United States. Of 17 orange juices examined, 15 listed Brazil as the source of all or part of the juice used. Six samples contained residues. All pesticides found were allowed for use in the United States, and all residues were well below EPA allowable tolerances in oranges.

The Connecticut Agricultural Experiment Station has had inquiries from consumers about orange juice labeled as containing juice from a foreign country. The interest is that older pesticides not allowed for use in the U.S., e.g. DDT (5), might have been used on oranges in foreign countries and may be contained in orange juice imported from those countries (primarily Brazil).

Current information shows that 17 different pesticides were used on citrus in Brazil, and 23 were used on citrus in the United States (4). In the United States, tolerances exist for 39 pesticides on citrus fruits (1). Some are used only in the orchard, while others may be used postharvest.

Only one of three samples of orange juice tested by the Food and Drug Administration (FDA) from 1982-1986 contained a residue (9). In the same period, the FDA tested 67 samples of fresh oranges, and only nine different residues of pesticides allowed in the U.S. were found (9).

Seventeen orange juices offered for sale in food stores in Connecticut were tested and results reported here.

MATERIALS AND METHODS

Seventeen samples of chilled orange juice (quarts or half gallons) sold in Connecticut were collected by an inspector of the Food Division of the Connecticut Department of Consumer Protection. Analyses for pesticides were made using FDA method 232.4 which screens for both chlorinated and phosphated pesticides and their metabolites (3).

RESULTS AND DISCUSSION

The juices examined and the source of the juice as listed on the label are shown in Table 1. Pesticides found are shown in parts per million (ppm) with the EPA allowable tolerance, also in ppm (1), in parentheses.

TABLE 1. Pesticides in orange juice sold in food stores. The number in parentheses is the EPA tolerance in ppm.

<table>
<thead>
<tr>
<th>Sample number</th>
<th>Source of juice</th>
<th>Pesticides found in ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brazil</td>
<td>ND</td>
</tr>
<tr>
<td>2</td>
<td>Florida &amp; Brazil</td>
<td>ND</td>
</tr>
<tr>
<td>3</td>
<td>None given</td>
<td>ND</td>
</tr>
<tr>
<td>4</td>
<td>Florida &amp; Brazil</td>
<td>Dursban 0.006(1)</td>
</tr>
<tr>
<td>5</td>
<td>USA or Brazil</td>
<td>ND</td>
</tr>
<tr>
<td>6</td>
<td>Florida &amp; Brazil</td>
<td>ND</td>
</tr>
<tr>
<td>7</td>
<td>Florida &amp; Brazil</td>
<td>Ethion 0.005(2)</td>
</tr>
<tr>
<td>8</td>
<td>Florida &amp; Brazil</td>
<td>ND</td>
</tr>
<tr>
<td>9</td>
<td>Florida &amp; Brazil</td>
<td>Ethion 0.005(2)</td>
</tr>
<tr>
<td>10</td>
<td>Brazil &amp; USA</td>
<td>ND</td>
</tr>
<tr>
<td>11</td>
<td>Florida &amp; Brazil</td>
<td>Guthion 0.040(2)</td>
</tr>
<tr>
<td>12</td>
<td>Florida &amp; Brazil</td>
<td>ND</td>
</tr>
<tr>
<td>13</td>
<td>Fresh squeezed</td>
<td>ND</td>
</tr>
<tr>
<td>14</td>
<td>USA &amp; Brazil</td>
<td>ND</td>
</tr>
<tr>
<td>15</td>
<td>Brazil &amp; Florida</td>
<td>ND</td>
</tr>
<tr>
<td>16</td>
<td>Florida &amp; Brazil</td>
<td>Imidan 0.022(5)</td>
</tr>
<tr>
<td>17</td>
<td>Florida &amp; Brazil</td>
<td>Guthion 0.020(2)</td>
</tr>
</tbody>
</table>

*Source as listed on label.
*bSqueezed from fresh oranges in store.
*ND = none detected.

Fifteen of the 17 samples listed Brazil as a source of all, or part of, the juice used. Two products listed Brazil before the USA or Florida. Since the ingredients which are listed as used in the product must be in descending order by weight, more juice from Brazil was used in the product than juice from domestic oranges (2). When USA is listed, this means that juice from oranges from any U.S. state could have been used. One product did not list the source of the juice.

Six of the 17 samples contained small amounts of residues. One sample contained two residues. In all cases the residues found were well below EPA tolerances for citrus fruits (1). There are no EPA tolerances for juice per se.

Three samples contained ethion, an insecticide-acaricide while two contained guthion (azinophos-methyl), one contained dursban (chlorpyrifos), and one contained imidan (phosmet), all insecticides (6). All are listed for use on citrus crops and have an EPA tolerance (1). Ethion is the only one found which is listed as being used in Brazil (4). Trace
quantities of these pesticides also have been found in both foreign and domestic produce (7,8,10).

We have shown that of the orange juice samples tested none contained pesticides which are not allowed to be used in the United States.

REFERENCES


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