Study on Streptomycin Level in Raw Milk

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SUMMARY

Streptomycin consists of three components, which are linked together by glycoside bonds, and it belongs to the group of the aminoglycoside antibiotics. Streptomycin is naturally produced by actinobacterium Streptomyces griseus. Therapeutically it is used in the case of streptococcal and enterococcal enteritis. Because of its side effects it is rarely used in human treatment, but has an application in the veterinary area. After the treatment of mastitis in breeding animals, increased values of streptomycin were also recorded in liver, kidney, muscle and milk. Presence of Streptomycins in milk has hygienic and industrial implications. Concerning the industrial aspect the Streptomycin residues are inhibitors for proliferation of the lactic microflora. In terms of hygiene, streptomycin can induce the antibiotic resistance phenomenon [1].

Streptomycin ELISA Test Kit is based on the competitive enzyme immunoassay for the detection of Streptomycin in meat, liver (chicken), milk, honey. The protein conjugated antigen is pre-coated on the micro-well stripes. In the testing sample the Streptomycin competes with the protein conjugated antigens pre-coated on the micro-well stripes for the antibodies against Clenbuterol. After the addition of the conjugated enzyme, the TMB substrate is added for getting coloration. The optical density (OD) value of the testing sample has a negative correlation with the content of Streptomycin in it. This value is compared to the standard curve and the content of the corresponding Streptomycin is subsequently obtained. Detection limit for milk is 0.1 ppb [2].

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Samples</th>
<th>Minimum value, µg/l</th>
<th>Maximum value, µg/l</th>
<th>Mean, $\bar{X}$</th>
<th>Standard deviation of the mean</th>
<th>Standard error of the mean, $s_\bar{X}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streptomycin</td>
<td>60</td>
<td>0.0</td>
<td>0.0800</td>
<td>0.01117</td>
<td>0.02132</td>
<td>0.002752</td>
</tr>
</tbody>
</table>

For every 60 whole milk studied samples, Streptomycin content varied between 0.0 and 0.008 µg/l with a mean ($\bar{X} \pm s_\bar{X}$) of 0.01117±0.002752 µg/l. 25 samples (41.6%) recorded a Streptomycin value below the detectable limit. The maximum value for whole milk is 0.2 mg/l, but the milk that gives positive results within Streptomycin test in not being used for milk products manufacturing.

REFERENCES