The pH of the Digesta in the Gastrointestinal Tract, in Laying Hens

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SUMMARY

In fowl the calcium necessary is high, both in chicken, due to the rapid growth of their skeleton, and in laying hens, due to the eggshell formation. These needs are covered by supplementing the diets with calcium carbonate (Guinotte, 1995), which in order to be absorbed needs an acid medium, assured in the stomach and the intestine by the chlorhydric acid secreted by the oxynticopeptic cells of the proventriculus (Burhol, 1971 cit. by Nys, 1990).

The experiment was carried out on 10 ISA Brown hybrid hens, 53 weeks old, individually caged, and fed with combined granulated fodder. The hens were killed by administrating iv. a T61 solution. Afterwards the digestive tracts of the hens was divided into 9 segments - ingluvies (ING), stomach (proventriculus and gizzard) (ST), upper duodenum (DP), lower duodenum (DD), jejunum (JEJ), upper ileum (PI), lower ileum (ID), ceca (CEC) and rectum (R). by double ligation with surgical thread, not allowing the post-mortem flow of the digesta into the segments. After the prelevation, the digestive segments were frozen and sectioned longitudinally, and the digestive content was collected, the biological samples being processed separately. After defreezing the pH of the digestive content was determined, using a portable pH-meter. The values from the segments of the digestive tract in hens are rendered in table 1.

<table>
<thead>
<tr>
<th>DIGESTIVE SEGMENT</th>
<th>ING</th>
<th>ST</th>
<th>DP</th>
<th>DD</th>
<th>JEJ</th>
<th>IP</th>
<th>ID</th>
<th>CEC</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>The mean value and deviation (n=10)</td>
<td>5.38±0.52</td>
<td>3.45±0.50</td>
<td>5.40±0.39</td>
<td>5.45±0.44</td>
<td>5.75±0.49</td>
<td>5.95±0.46</td>
<td>6.25±0.68</td>
<td>6.05±0.28</td>
<td>7.20±0.54</td>
</tr>
</tbody>
</table>

The analysis of the data reveals that the pH values are acid along the whole length of the digestive tract, except the rectum, where both the individual values and the mean values (7.20±0.54) of the pH lie between 7.00 and 8.00. The lowest mean value (pH=3.45±0.50) is found in the stomach (proventriculus and gizzard), favouring thus the solubilisation and dissociation of the minerals. The pH values measured by us in the digesta from the ileum are similar to those measured by Zdunczyk et. al., (2005) in the ileum (pH = 6.30) and cecum (pH = 6.88) in turkeys.

Keywords: laying hen, pH, digesta, digestive segments
REFERENCES

