Cacao pod extract (*Theobroma cacao* L) for maintain the shelf life of chicken and duck carcasses

Obin Rachmawan, Eka Wulandari*

Faculty of Animal and Husbandry, Padjadjaran University. Jl. Raya Bandung Sumedang Km 21, Jatinangor Sumedang 45363.  
*e-mail: eka_chem@yahoo.com*

**Abstract**

The extract of cacao pod (*Theobroma cacao* L) was potentially used to preserve carcasses of chicken and duck. In this research, the carcasses of broiler chicken (strain Cobb), cock layer race chicken and duck (*Anas javanica*) were soaked by the extract of cacao pod (50% w/v) with soaking time variation of 10 minutes, 20 minutes, 30 minutes and 40 minutes. The aimed of this research is to find out the soaking time that yield the longest shelf life. Chemical analysis used was Pb acetic assay and pH measurement. The result showed that the carcasses of broiler chicken that was soaked for 10 minutes can result the longest shelf life which is 23.9 hours (pH 6.21), the carcasses of cock layer race chicken that was soaked for 20 minutes can also result the longest shelf life which is 20 hours (pH 5.72) and lastly, the carcasses of duck give the longest shelf life at 23.9 hours soaking (pH 5.73).

**Keywords**: cacao, carcasses, chicken, duck, shelf life.

**Introduction**

Chicken and duck carcasses is a perishable food. It can be spoilage physically, biologically, biochemical reaction and microorganism contamination. High protein content, mineral and other element in carcasses are nutrition for microorganism growth (Jay, J.M., 1992).

Microorganism which is spoilaged the carcasses derived from livestock and postmortem carcasses contamination. Surface carcasses contamination begin from the slaughtered of chicken and duck until it is consumed. The contamination influence the shelf life of chicken and duck carcasses. The microorganism would used nutrient content in the carcasses to make microbial, chemical and physical changing during it stored. Carcasses contamination is decreased it quality (Forrest, 1975).

Using the chemical compound for maintain the shelf life of chicken and duck carcasses were make restless, there for we were examined the cacao pod extract substituted the chemical compound. Cacao pod was agroindustry waste because seed cacao was used for making cacao. Cacao pod was reached 80% from fresh cacao and the fibrous content was reached 33.19%.

Polyphenol content in cacao pod extract was suggested increasing the self life of chicken and duck carcasses which was soaked in the extract. The aim of this research was to find out the soaking time that yield the longest shelf life.

**Materials and Methods**

The main object used in this research was 3-month-old duck carcasses (*Anas javanica*) from Jatiroke, Jatinangor, Sumedang; 8-week-old chiken carcasses (strain *Isa Brown*) from Ciamis, West Java. 4-week-old broiler chiken carcasses (strain *Cobb*) from Tanjung Sari, Sumedang. Cacao pod extract (Upper Amazon Hydride) was from Rajamandala, West Java.

**The Preparation of Cacao Pod Extract**

Cacao pod was rinsed to removed dust and then it leaked through. Cacao pod were blended with water (70°C) and finally it was filtered. The solution was the extract.

**Sample Analysis**

The shelf life of chicken and duck carcasses was investigated 12 hours after the carcasses soaked in the cacao pod extract (50% w/v) and it was repitition every 2 hours. The chemical analysis of the carcasses was using Pb acetic acid assay and pH measurement.

**Statistical Analysis.**

Analysis of variance (ANAVA) and Tukey’s studenitized range test at the p ) 0.05 level of significance were used to evaluate the differences in time of soaking among the four treatment.
Results and Discussion

The shelf life of chiken and duck carcasses with variation time of soaking was shown in Table 1 which indicate that the shelf life of chiken and duck carcasses was increased with increasing the time of soaking. Usually chiken and duck carcasses which is not soaking with cacao pod extract spoildag after 12 hours stored in room temperature. Polyphenol in cacao pod extract suggested active reducing microorganism growth. Polyphenol was denatured protein and destroyed the cell membrane with solving the lipid membrane in cell wall (Ingram, 1981).

Table 1 Shelf life of chiken and duck carcasses with variation time of soaking

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Variation Time of Soaking (minutes)</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>chiken carcasses (strain Isa Brown)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>19a</td>
<td>19</td>
<td>21.5</td>
<td>19.5</td>
</tr>
<tr>
<td>broiler chiken carcasses (strain Cobb)</td>
<td></td>
<td>17.6</td>
<td>23.9</td>
<td>25.8</td>
<td>25.9</td>
</tr>
<tr>
<td>duck carcasses (Anas javanica)</td>
<td></td>
<td>24</td>
<td>25</td>
<td>26.5</td>
<td>24.5</td>
</tr>
</tbody>
</table>

The value are average from four replication. Value in each column with different superscripts are significantly different (p < 0.05).

Chiken carcasses (strain Isa Brown) and duck carcasses have the similar pattern, which are no significantly different among four time of soaking. This was shown that 10 minutes soaking was effective to reduce the microorganism growth. Broiler chiken carcasses (strain Cobb) which was soaked 20, 30 and 40 have no significantly different among each other and it was shown 20 minutes effective to maintain the shelf life of the carcasses.

pH of chiken and duck carcasses with variation time of soaking was shown in Table 2. After post mortem chiken and duck carcasses has pH 5.8 – 5.9 (Salle, 1984). The pH measured to know the spoilage of carcasses which was shown in neutral to bases pH.

Table 2 pH of chiken and duck carcasses with variation time of soaking

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Variation Time of Soaking (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>chiken carcasses</td>
<td>5.72 5.95 5.79 5.99</td>
</tr>
<tr>
<td>broiler chiken carcasses (strain Cobb)</td>
<td>6.21 6.21 6.19 6.22</td>
</tr>
<tr>
<td>duck carcasses (Anas javanica)</td>
<td>5.73 5.43 5.6 5.57</td>
</tr>
</tbody>
</table>

The value are average from four replication.
Conclusions

The carcasses of broiler chicken that was soaked for 10 minutes can result the longest shelf life which is 23.9 hours (pH 6.21), the carcasses of cock layer race chicken that was soaked for 20 minutes can also result the longest shelf life which is 20 hours (pH 5.72) and lastly, the carcasses of duck give the longest shelf life at 23.9 hours soaking (pH 5.73).

Acknowledgements

The Author was grateful to Dina Tri marya, Ahmad Nopa Saici Albi and Dani Arisandi for the corporation of this research.

References


