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SUMMARY

It has been pointed out that during slaughter, dressing, and cutting, microorganisms come chiefly from the exterior of the animal and its intestinal tract but that more are added from knives, cloths, air, workers, carts, boxes, and equipment in general. A great variety of microorganisms are added, so that it can be assumed that under ordinary conditions most kinds of potential spoilage organisms are present and will be able to grow if favorable conditions prevail.

The purpose of meat curing is usually considered an improvement of the flavor as a result of the chemical changes, increase its tenderness, in addition to the preservative effect. This work was carried out to examine and trace both microbiological and chemical changes of meat during the curing process. The results obtained in this investigation can be summarized as follows:

I- Microbiological Changes:

I-1. Microbiological examination of tested meat and curing solution:

Results of this part showed that the changes in the density of the total viable count of bacteria of meat increased about 1.6

times after two days. After 10 days, the number of Enterobacteriaceae members reached 3.5×10^3 cells/ml of curing solution. These dangerous organisms decreased by 5.0 times in meat sample during the whole process. The proteolytic bacteria of curing solution gave 4.9 increasing fold after the 10^{th} day higher than that number of control. Meat, on the other hand, showed about 4.4 increasing fold.

I-2. Examination of some specific bacterial group:

Data of these experiments showed that the highest value of total bacterial count was found after the 4^{th} day being 6.4×10^3 cfu/ml of the curing solution. In contrast, the highest record of proteolytic bacteria was found after the 8^{th} day. Lipolytic bacteria was also higher at the 8^{th} day being 2.7×10^3 cfu/ml of the curing solution.

I-3. Study of enzymatic activity of some bacterial isolate:

Results suggest that short-rod bacteria were the most active in the enzyme production followed by the spore-forming bacteria. The application of polynomial regression analysis, showed a positive linear regression between the values of H/G% against bacterial cell diameters. The regression equation was: Y = 745.03 - 71.75 - 2.47. Moreover, another positive linear

regression was also obtained by plotting H/G% against the diameter of clear zone by this regression equation:

$Y = 1513.95 - 278.45 + 17.88.$

I-4. Quantitative of enzymatic activities in curing solution:

Data exhibited that the peak of proteolytic activity was recorded at the 10^{th} day being 185 Tyrosine Unit. For lipase activity, the peak was observed at the 9^{th} day equal to 18.0 Lipase Unit.

I-5. Identification of selected isolates:

Two isolate were selected and subjected to a detailed taxonomic studies using the protocol of Bergey's Manual of Systematic Bacteriology. Results obtained suggest that both of them are belonging to family Bacillaceae, i.e., *B. pumilus* and *B. pasteurii*.

II- Chemical Changes:

II-1. Chemical description of the curing solution:

The maximum reading of the curing solution turbidity at 475 nm was observed at the 9^{th} day. The values of pH are ranged in the neutral area being between 6.83 to 7.27. The maximum value of total nitrogen was recorded at the 9^{th} day. Meanwhile, the value of the total protein was 1.69% after the 10^{th}.

II-2. Values of sugars measured in the curing solution:

Higher value of reducing sugars was observed after the 10th day being 0.16%. The maximum value of non reducing sugars was found at the 8th day. The amount of the total sugars decreased up to the 6th day then increased again to the end of the treatment.

II-3. Chemical description of meat during the curing process:

The values of pH of the tested meat were found in the neutral range being between 6.95 - 7.25. The value of moisture is decreased from the beginning of the process up to the 4th day, then increased, then decreased again up to the end of the process. The tenderness of meat increased about 1.5 times during the ten days of the curing process.

II-4. Protein value of dried meat during the process:

The maximum protein value was found at the 2nd day, then decreased up to the 4th day. Again the value increased up to the 6th day. Data also showed that the concentration of NaCl as an preservative agent in meat was increased by 5.5 times compared to the control. The values of the free amino nitrogen decreased up to the 4th day then remain constant. Non protein nitrogen start to decrease sharply up to the 4th day.

III- Evaluation of the Curing Process:

III-1. Microbiological evaluation:

As expected, the bacterial total count was increased. The medium of NA gave 1.5 fold increase while 1.2 was observed with TGY medium. Faecal coli, completely disappeared during the process while Enterococci reduced to about 0.3 fold. The fungi were also reduced after the process to about 0.1 fold. Moreover, the proteolytic and lipolytic bacteria increased by 1.8 and 1.2 for both, respectively.

III-2. Chemical evaluation:

The pH value of the meat was increased by 1.03 change fold. The moisture content was decreased by 0.96 fold. The water holding capacity of meat decreased by 0.85 fold. Meat tenderness increased by 1.45 fold.

III-3. Effect of addition of the bacterial proteinase:

The value of tenderness was increased to 41.5% by *B. pumilus* proteinase and 39.0% by *B. pasteurii* proteinase. The water holding capacity was also increased by 105.3% by *B. pumilus* proteinase and 156.7% by *B. pasteurii* proteinase.