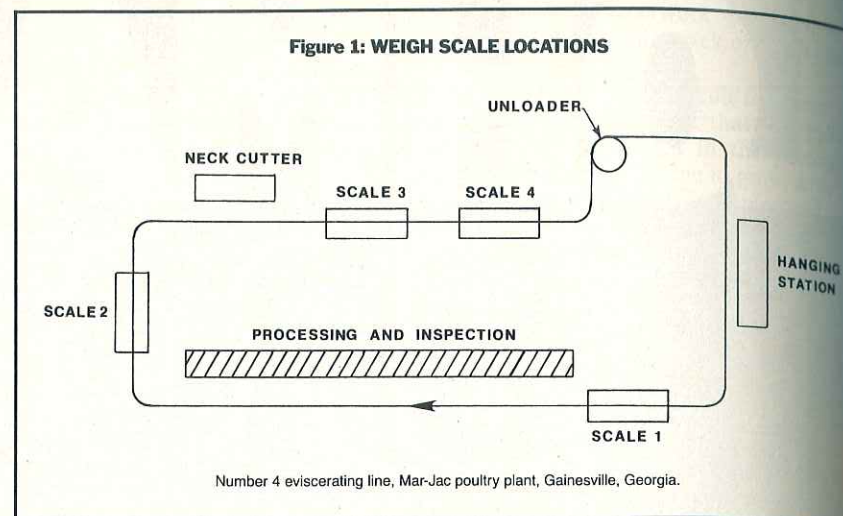


Monitoring Eviscerating Line Yield

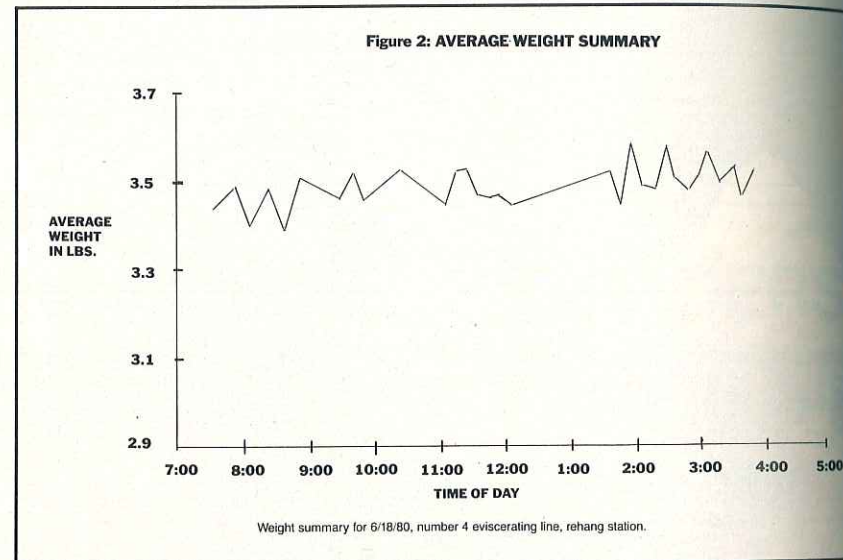
For the past two and a half years the Agricultural Technology Branch of Georgia Tech's Engineering Experiment Station has been working on developing a computer-based system to monitor and evaluate poultry processing plant eviscerating line performance. Knowledge of how well the eviscerating lines are operating is important because eviscerating line performance, as measured by line yield, is a direct measure of plant productivity. Because poultry processing plants operate under high volume and low profit margin conditions, a small change in line yield can have a dramatic effect on plant profitability. With the continually increasing performance and reliability and decreasing cost of electronic systems, the time seems right for the introduction of computer-based measurement systems into poultry processing plants. An electronic yield evaluation system is especially attractive because estimates indicate that the time required for such a system to pay for itself would be less than one year.

The operating principle of the eviscerating line yield evaluation system is quite simple. In its basic form the system consists of two weigh scales and a small computer. One scale is installed at the hanging station, while the other is located at the bird unloader. Weight readings from these scales are input to the computer, which periodically calculates and displays the line yield. Line yield is defined as the fraction of bird weight at the hanging station that is dropped at the unloader. Because line yield is being displayed as it is occurring, problems can be quickly identified and corrected. In fact if the yield drops below a minimum acceptable value, an alarm can be made to sound, thus alerting plant personnel that immediate corrective action is required.

To the basic system just described, a number of improvements can be made to provide more information. Total birds processed, as well as total and average weights and weight distributions, can readily be calculated and displayed or printed. Additional scales could be installed at intermediate positions along the line to evaluate individual processing operations. For example, weigh scales installed before and after the neck cutter would make it possible to keep track of the total neck weight being processed as well as the percentage of neck weight to bird weight. This information could be used



Number 4 eviscerating line, Mar-Jac poultry plant, Gainesville, Georgia.



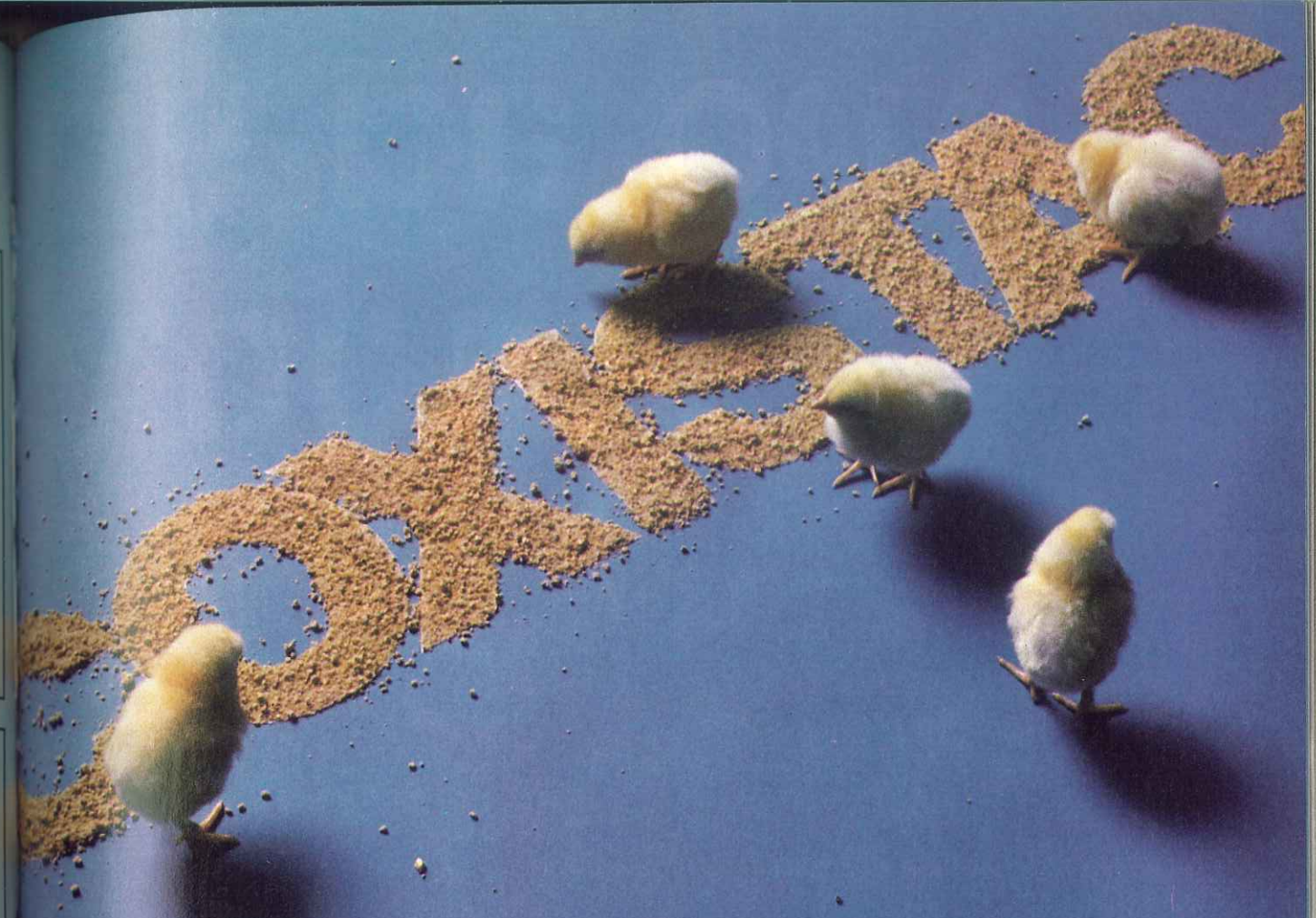
to keep the neck cutter adjusted for best performance. With some additional hardware, line stoppage by inspector also could be monitored and a record of the number of times and the total time each inspector had stopped the line.

By carrying these ideas a little further, it is easy to visualize the operation of a processing plant with instrumentation installed at all important processing locations. Data could be collected and input to a minicomputer and the complete plant operating performance could be displayed at one central location. Computer-generated graphs could easily be provided at the end of the day's production to give a summary of the entire plant operation for the day.

The Georgia Tech yield evaluation system in its present state of develop-

ment can be thought of as the first step toward a completely instrumented processing plant. The system, as installed on an eviscerating line at the Mar-Jac poultry plant in Gainesville, Georgia, USA, presently consists of a small desk-top computer, computer interfaces, a video display terminal, and four weigh scales using modified line shackles. The overall operation of the system can probably be best understood by referring to Figure 1 which shows the locations of the weigh scales on the eviscerating line. As the figure shows, one scale is installed at the hanging station, one scale is located just prior to the neck cutter, and the remaining two scales are located close together before the bird unloader. With this arrangement, overall line performance, as well as the operation

(Continued on page 26)



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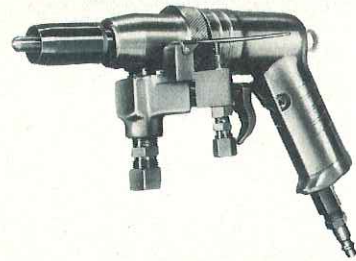
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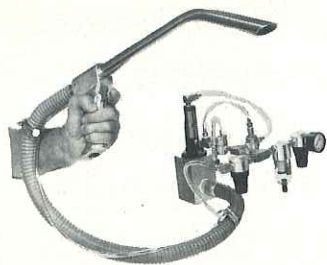
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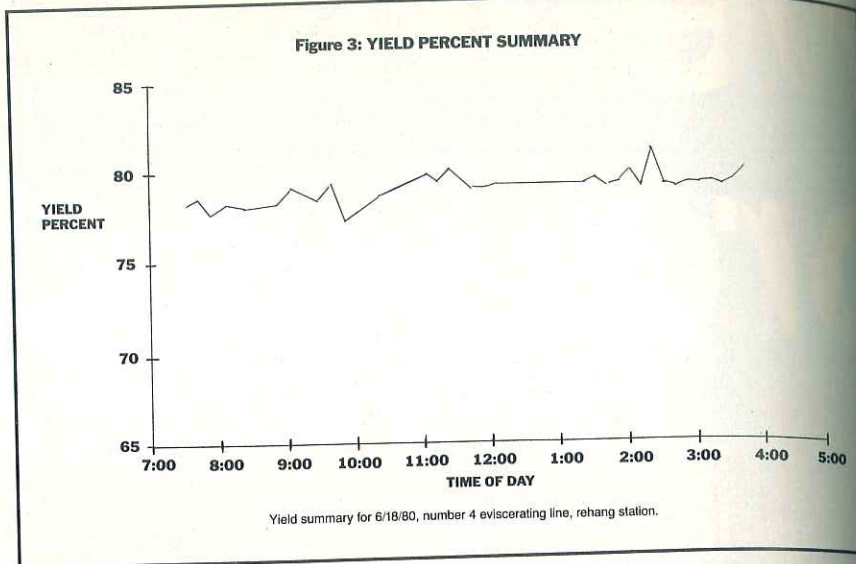
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Monitoring Eviscerating Line Yield

(Continued from page 22)



of the neck cutter, can be evaluated. Also by installing the last two scales close together, the accuracy of the weigh scales can be determined.

As the system is now operating, about every 10 minutes the weight readings are displayed on the video display terminal and printed on the computer printer. The line yield and average weight at the unloader are printed for the production cycle just completed, and the video display is updated to show running totals and averages. Total birds and total weight processed are several of the items that are shown on the video display terminal.

The weight readings are also stored on magnetic tape cartridges for later

analysis. Periodically, this data is output to a computer plotter and daily yield and average weight summaries are obtained. Figures 2 and 3 show typical examples of such plots. By acquiring large amounts of data, we hope to be able to determine the effects of such variables as time of day, bird type and weight, as well as seasonal variations on the line yield. Although the system in its present form has yet to reach its potential of long-term reliable operation, the results obtained so far are quite promising, and we feel that with continuing work we will have a practical and cost-effective system for poultry processing plant use.—Larry J. Moriarty, P.E. Research Engineer, Georgia, Tech.

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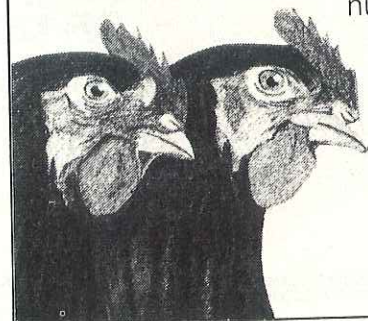
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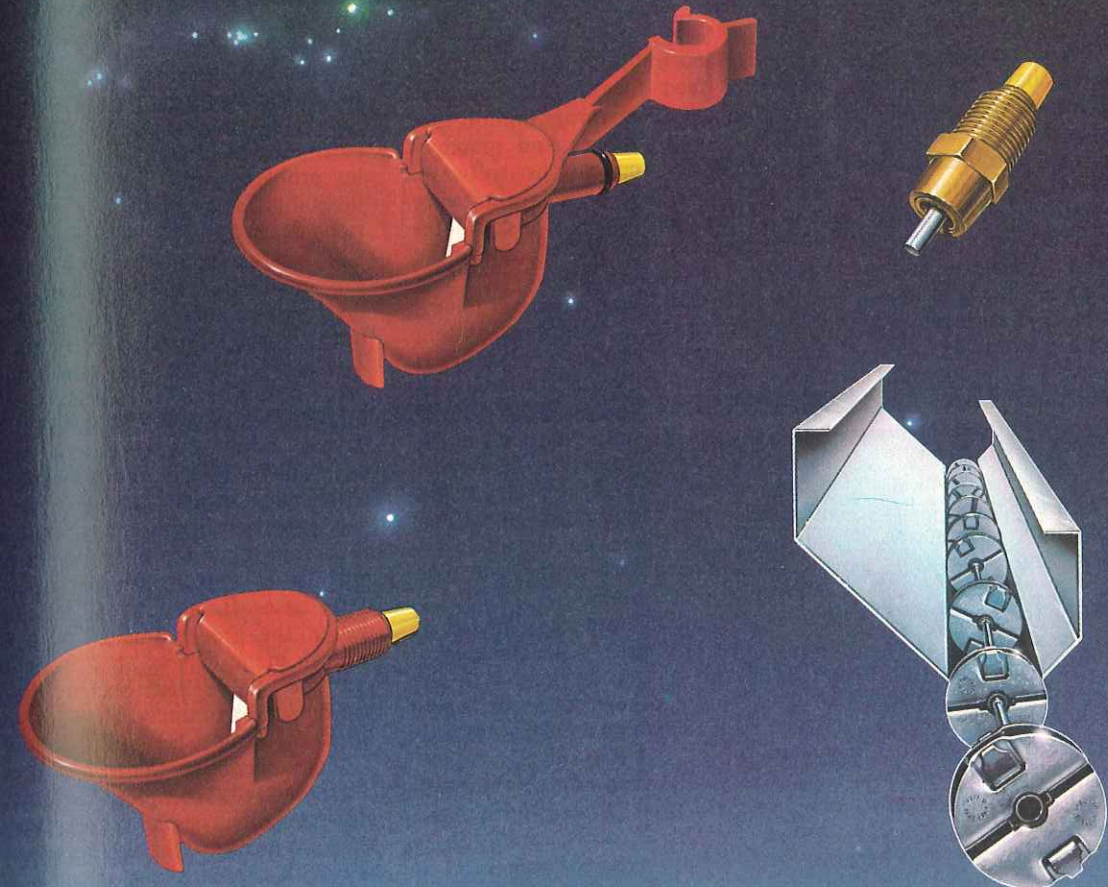


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