

Lecture 8

Consequences and Benefits

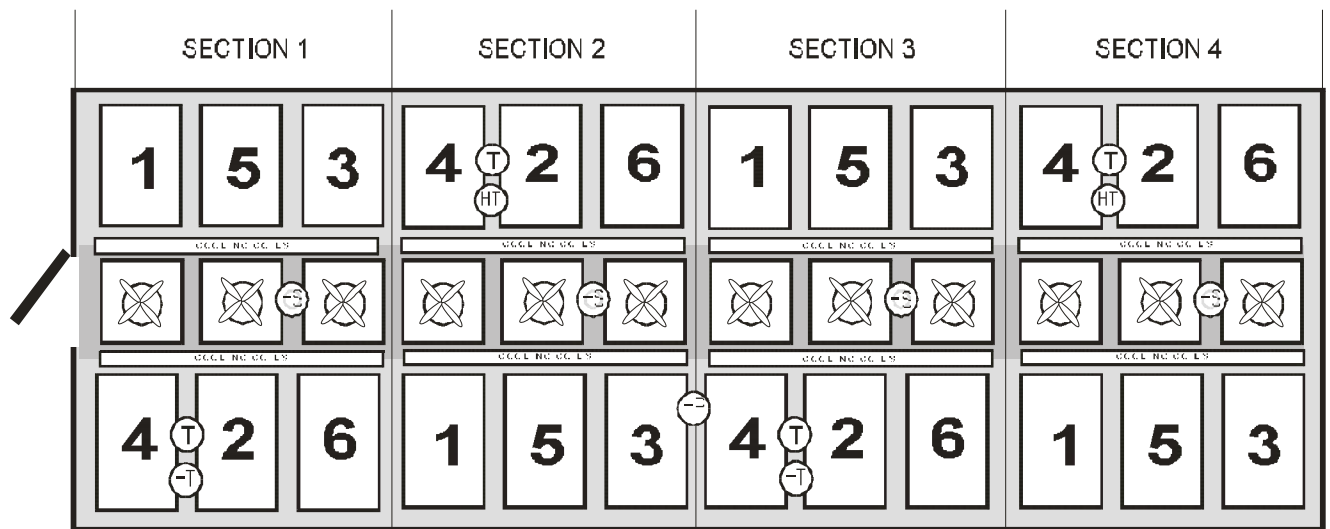
We have seen that the concept of sealing the machine for the first 10 days creates an environment of high humidity and CO₂ levels. This is a very stable environment from which the high humidity produces excellent convection properties. This aids heat transfer and the temperature within the machine is distributed evenly throughout.

The benefits are considerable, but the benefits are more pronounced on young and old flocks and can be as much as 5% over multistage. Other benefits include a narrower hatching window and a much stronger and bigger chick. Trials have also proven that chick mortality is reduced with better grow rates and food conversions on the farm. We can explain this improvement in many ways to that of just the CO₂ concentration, which are:

- Better temperature distribution throughout improved by airflow and high humidity conditions.
- No interruption from start to finish with no artificial humidity required.

Figure 1 shows the typical setting pattern of a multistage machine. It can be seen that on one particular new set, setting number 6 is adjacent to adjacent to setting number 1. The plot shows what happens on setting number 1 when setter number 6 is introduced. The result is overheating of the older eggs in setting number 1. This is not always appreciated as the control probes do not detect this condition. Temperatures can reach as high as 38.5 degrees C with obvious consequences.

Figure 1: Typical setting pattern of a multistage machine



SM24 twenty four trolley, four section multi-stage setter

KEY:

HUMIDITY PROBE
 HIGH TEMPERATURE ALARM
 TEMPERATURE PROBE
 HUMIDITY SPRAY

Heating and Cooling

The next two plots show the heating and cooling activity within the single stage setter. These again are screen shots taken from the Galaxy system for an A12 setter.

The vertical lines represent the heating and cooling activity; where a line stops at a value of 1 represents a period of activity for heating and a line that stops at 2 represents a period of activity for cooling.

Total Control of Incubation Process

The earlier sections have shown the key objectives and the practical considerations to optimising performance. This section is dedicated to the tools that are provided to the hatchery manager to achieve this. Programming of the stage recipe can be performed either from the Touch Screen control or from the Galaxy system. The easiest method of programming is from the Galaxy system. The system is very user friendly and is all achieved from keyboard entry and a few clicks of the mouse. The system allows the user to download, upload and save stage programs. It is also possible to batch transfer a program to a maximum of 20 machines all in one go. The hatchery manager is then able to adjust and fine-tune the settings according to flock age etc.

To assist in management of the machines, programs can be downloaded to the machine when in manual run and whilst the machine is out of service. Once loaded, the machine can be placed into the program, run and ready to start. All the operator has to do is load and start the machine. The rest is automated!

Delayed Start

The single stage machine has a delayed start facility; this allows the manager to load the machine and program the machine to start at a predetermined time. This is particularly useful when starting times are outside of normal working hours. There is no heating during this period of delay other than the paddle fans are started up and ran for 5 minutes on the hour of each hour during the delayed starting period.

Auto Level System

Programmable from the Touch Screen the user can program the turning to stop for a predetermined amount of time in the level position. For example it is possible to have the turning stop at the level position for 10 minutes over a 60-minute turning interval. There is a definite advantage from this as this

increases the air gap between the eggs and thus improves airflow. This is particularly advantageous after the 14th day of incubation when the heat given off by the eggs increases. The improved airflow assists in heat transfer from the eggs.

Summary – Advantages of Single Stage

- **Bio security – Supermarkets – Veterinary Inspections**

Increasingly, the market is dictating on bio security, the process and the design of the machine are well suited to satisfy these requirements.

- **CO₂ Concentration**

The machine can benefit from the concentration of CO₂ levels. The environment created has properties of self containment and good temperature distribution through the high humidity conditions.

- The hatchery manager is able to take full control of the process through the Touch Screen or Galaxy system
- Narrower hatching window
- Increased quality and quantity of hatchery output. Hatchability is much improved over multistage especially for younger and older flocks. Chicks are stronger and bigger resulting on the farm with less mortality and better grow out rates.
- Reduced labour requirement, due to the automation and in the method of the operation less labour is required.
- The process is simpler. It is not required to have skilled staff at the operative level