INFO SHEET

# Alternatives to Conventional Brooding:

## Large Ring and Whole Room

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For at least the last 25 years, the turkey industry has attempted to perfect brooding turkeys utilizing "conventional" brooding techniques. That is: single ring brooding using gas or propane fired brooders (typically 30,000 btu's each) with supplemental or temporary feeders and drinkers. These individual rings typically hold 300 to 400 poults from placement till six or seven days of age. At the same time, we as an industry are being challenged to find ways to reduce on farm labour and decrease fuel costs without compromising environmental conditions. The North American turkey industry has recently experimented and adopted large ring and whole house brooding techniques that closely mirror what the broiler chicken industry has been doing successfully for many years.

Large ring and whole room brooding does not remove the need for good turkey husbandry. The management during the first few weeks of a poult's life will determine its ability to reach its full genetic potential. Poults that do not get off to a good start will not be able to regain lost growth or have compensatory gain. It is important to note that when evaluating whether new brooding techniques are successful or not, parameters such as flock uniformity, morbidity and weight for age are key measurements in addition to the one or two week mortality levels.

This info sheet will review the differences between conventional brooding and large ring and whole room brooding. Emphasis will be placed on the environmental and ventilation management challenges which must be considered when brooding large groups of poults. These will include:

- Keys to large ring/whole room success
- Whole room brooding versus large ring brooding
- Radiant stove options and set up: Quadradiant, Tube, and Radiant Stoves
- Ventilation: importance of air and draft control using minimum ventilation techniques and circulation fans relating to large ring/whole room brooding

It should be stated that regardless of which method is used to brood poults there is no substitute for being prepared prior to when poults arrive. This includes a clean and disinfected house and water lines, sound nutrition, properly functioning and calibrated equipment, and supervision of the brooding process.

## Conventional Brooding: Why it is successful

Conventional brooding (as defined previously), may be the safest, least risky method to brood poults. However, it is also the most labor intensive and may be the most costly in terms of fuel use after the birds are released from the rings. Conventional brooding typically has 300 – 400 poults per stove with approximately 7.6 linear metres (300 linear inches) of supplemental feeders spaced within the ring so that all poults (weak or strong) can easily find feed. Supplemental drinkers are typically used as stand-alone or in conjunction with nipple style drinkers. In either case, supplemental drinkers require washing and disinfecting during brooding. The room temperature using conventional brooding is typically cooler, approximately 29°C (84°F) to start. These smaller separate rings afford more individual control during the brood period. There is less opportunity for a large group of birds to congregate and individual stove temperature control is usually the norm. Poults are kept close to the center of the stove where the spot heat temperatures of 35°C (95°F) to 46°C (115°F) are easily maintained and brood ring edge temperatures near 29°C (85°F) allow poults to find their comfort zone. Stoves cycle on regular intervals that move the poults past feed and water as they find their comfort zone.

**Table 1.** Temperature Guidelines—Conventional Brooding vs. Whole Room Brooding

| | Conventional | | Whole Room | |
|---|---|---|---|---|
| Day | °C | °F | °C | °F |
| 1 | 29 | 84 | 36 | 96 |
| 2 | 29 | 84 | 35 | 95 |
| 3 | 29 | 84 | 34 | 94 |
| 4 | 29 | 84 | 33 | 92 |
| 5 | 28 | 83 | 32 | 90 |
| 6 | 28 | 83 | 31 | 88 |
| 7 | 28 | 83 | | |

## Whole Room Brooding

Whole room brooding is simply defined as brooding turkey poults without the use of rings to confine them under a single heat source. This method was patterned after brooding chicks in the broiler industry. This method was implemented initially in turkey operations that utilize the brood and move system, where the brooder house is used frequently on short cycle turns, i.e. every 8 weeks a new group of poults are placed. Elimination of brooder rings as well as supplemental feeders and drinkers resulted in a significant reduction in labour.

One of the disadvantages to whole room brooding is the higher risk of piling poults in the corners of the house. Poults can easily lose their connection to the heat source and will find that source by piling along walls or in the corner of the house. In order to avoid this, whole room brooding requires significantly higher brooding temperatures for the first few days of brooding. Table 1 lists the recommended target house temperatures for brooding under conventional methods vs. whole room brooding. It can easily be seen that whole room brooding requires warmer temperatures which must be consistent throughout the house to keep poults comfortable and evenly dispersed. Excessively high room temperatures can lead to poor environmental conditions if ventilation is not managed accordingly. This may be the largest drawback for using this brooding method. However it must be emphasized that adequate air exchange needs to occur regardless of the room temperature, otherwise poult activity and feeding behavior will decrease. In addition, increased temperatures can have a dehydrating effect on poults or contribute to roundheart and flip-overs, especially if ventilation is inadequate. The presence of split wings in poults is an indication that overheating has occurred.

One of the most effective methods to whole room brood is with the use of fin pipe heat. Fin pipes are hot water pipes that are placed strategically throughout the brood room. Hot water circulates through the pipes and warms a series of fins that are attached to the pipe. A coal, propane, natural gas or wood fired furnace heats the water in an exterior building, so there is no combustion process within the brood room. This reduces any noxious gases such as carbon monoxide and increased humidity, which may cause poor air quality and affect poult performance.

## Large Ring Brooding

Large ring brooding is a combination of conventional and whole room brooding. It utilizes the spot heat of radiant stoves which provides a central focal point for brooding with rings, but utilizes a larger brood area where 800 to 3,500 or more poults are brooded. The advantage of large ring brooding is that a lower room temperature can be achieved compared to whole room. Also, less supplemental feeders and drinkers are used and fewer rings need to be set up compared to conventional brooding, resulting in less labour. Typically, radiant style brooding is implemented. Radiant brooder stoves, Quadradiants and tube heaters are the most common radiant stoves used in large ring and some times whole room brooding. These stoves typically achieve temperatures under the heat source of 35°C (95°F)) to 46°C (115°F). Temperatures along the edge of the ring will typically be 31°C (88°F) to 32°C (90°F) for the first two days of brooding. This allows room temperatures to be approximately 2.2°C (4°F) to 3.3°C (6°F) less than whole house brood temperatures the first week.

## Ventilation Control

Regardless of the type of brooding, ventilation control is extremely important. Air exchange providing oxygen and removing carbon monoxide, carbon dioxide and moisture are critical. Minimum fan timers under negative pressure ventilation systems can be utilized to ensure minimum ventilation rates necessary for controlling room moisture and gases. A useful web based tool is the minimum ventilation rate calculator available from the University of Georgia Biological and Agricultural Engineering at www.poultryhouse.com. This calculator is based on house temperature, humidity and water consumption.

At the same time, it is important to control the air flow in the house to reduce drafts and utilize the heat that accumulates near the ceiling of the brooder house. Low volume circulation fans can be used to reduce temperature stratification from floor to ceiling and provide even room temperatures post brood from end to end and wall to wall. It is important to control drafts caused by poor ventilation or a leaky barn, as they can decrease feed intake by forcing poults to bunch in drafty areas. These conditions can lead to low early feed consumption and weight gain, as well as poor flock uniformity in the brood and growout phases.

This can be achieved by utilizing a tight barn and baffled inlets, either attic or sidewall, and optimizing air flow patterns in the brood room.

Lighting in large ring and whole room brooding is improved over conventional due to less shadows from brooder stoves. When large ring/whole room brooding is implemented, advantages of the improved space available and the increase in feed and water availability are realized. Transitional feeding requirements to automatic feed lines are improved, due to the fact that the lines are included with these techniques. Water availability is improved, as long as manufacturer specifications regarding poults per drinker are followed.

Whole room and large ring brooding can be a significant change to a brooding system. As people struggle with change, poults also struggle with change. Whole room and large ring brooding reduce the changes that come with conventional brooding. Environmental changes such as removing poults from rings, removing supplemental feeders and drinkers and adjusting to automatic lines are reduced. Producers willing to adjust temperature profiles, be attentive to ventilation strategies and spend time managing whole room/large ring brooding systems can take advantage of potential fuel savings (up to 25% less than conventional), labour savings (up to 50% less than conventional) and improved performance.



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