

Nest Box Type and Management



Outline

- Nest boxes provide a safe place where females will instinctively go to lay their eggs.
- Nest boxes incorporate a facility for pushing females out of the nests and allow for the collection of eggs.
- There are 2 types of nest boxes (manual and automatic) and their naming refers to the type of push-off and egg collection mechanism.
- Design and management of nest boxes are covered in Aviagen Turkey's Management Guidelines for Breeding Turkeys. This Technical Advice Sheet provides additional details about the design and management of nest boxes in order to maximise the welfare and productivity of birds and farm staff.

MANUAL VERSUS AUTOMATIC NEST BOXES

There has been considerable discussion about the relative egg production between automatic and manual nest box systems. Table 1 shows some key differences between manual and automatic nest types. In our experience similar egg numbers can be expected when both systems are managed to a high standard.

	Nest Box Type	
	Manual	Automatic
Capital investment	Lower	Higher
Labour requirement	Higher	Lower
Collections per day	Limited by labour	Many
Flexibility	High	Low
Settable eggs per hen	Equal if managed to a high standard	Equal if managed to a high standard
Cleaning and disinfection	Requires dismantling	In-situ

Table 1. Manual versus automatic nest boxes.

MANUAL NEST BOXES

Manual nest boxes are designed to allow farm staff to manually collect eggs. It is important to consider both the welfare of the bird and farm staff when choosing a design of nest box system.

Single tier boxes are used for all strains. Nest boxes are typically constructed from wood, but they can also be made from metal or plastic (see examples in figures 1 and 2). Nests can be a significant source of carry-over of bacteria and other pathogens between flocks. Effective cleaning is a key priority for nest box design this is of particular importance as part of a salmonella control programme.



Figure 1: Typical wooden nest (left) and plastic nest (right)

Manual nest boxes are usually built in blocks of 4, 5 or 6 boxes (Figure 1) depending on the size of available materials. Sometimes, smaller blocks of 2 or 3 nests are made as in-fills to fit a particular house/pen layout. Building nest boxes in blocks makes it easier to move during the clean out process (Figure 2).



Figure 2: Plastic nest boxes in blocks of five

Nests should be fitted with a trap mechanism which provides females with easy access to the nest box but prevents more than one female entering the nest at a time. Without the use of traps, it is common to find 3 to 4 females on one nest which leads to excessive egg breakages, broodiness, and discomfort to females and damage to nest boxes. It is essential the trap mechanism does not cause damage to the female on entering or exiting the nest. Maintenance of traps is important to ensure they open and close properly.

There are several designs of traps; examples are shown in figure 3.



Figure 3. Nest trap designs. Wire trap (left), wooden paddle trap (middle), plastic trap (right)

The nest box should be large enough to allow the female to turn around and stand easily within the nest. The correct size nest should allow the female to be pushed off the nest, collect the eggs (Figure 4) and check for broody birds. Typical nest box dimensions are 50 cm wide x 60 cm deep x 60 cm high. The minimum front opening height should be 35 cm and this should not be reduced by the nest trap (Figure 5). Wider nests with a taller front opening are recommended for larger turkey strains.



Figure 4: Correctly sized nest with hinged top.

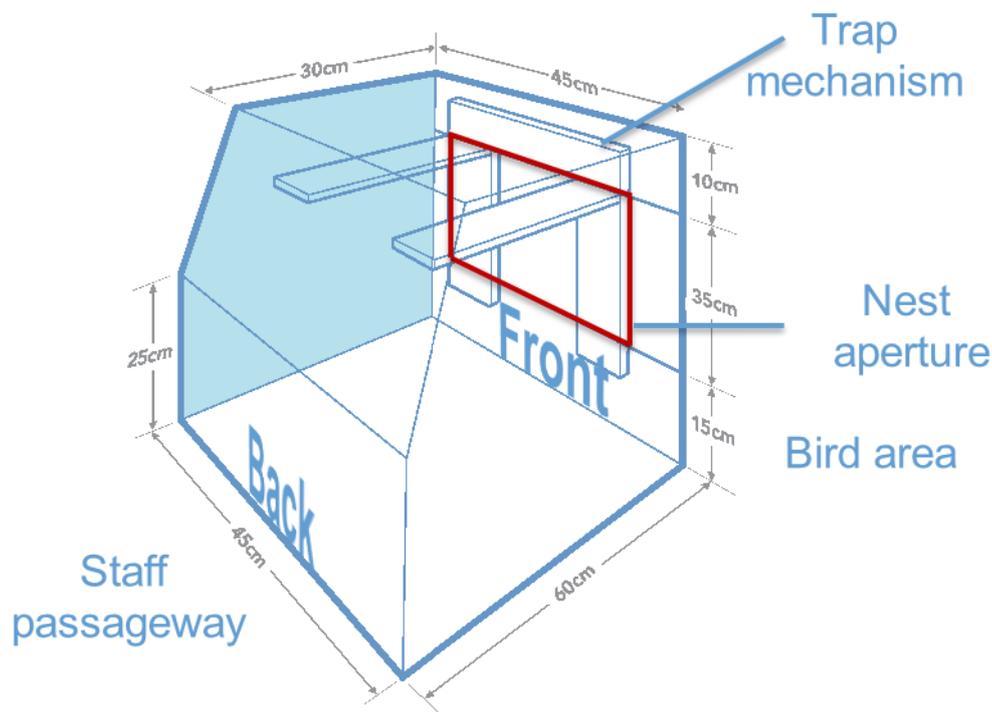


Figure 5: Typical nest box dimensions

An open nest box design makes the inside of the nest light and airy and also allows females to be broody checked and removed easily from the back of the box into the passageway if necessary. Both of these requirements can be provided for by a slatted nest top that can be hinged open and secured with a fastener to prevent females escaping (Figure 4).

The front of the nest box should be fitted with ramps (also known as step-ups or alighting boards) that allow females easy access to the nests. Ramps need to be wide enough to allow two females to pass and be horizontal or at an angle to the floor. The ramp angle must not cause the female to become unbalanced. An additional benefit of ramps is in preventing females from carrying floor litter into the nest. Ramps are usually between 12cm to 18cm high depending on the strain of bird used, heavier birds generally prefer lower heights.

Nest boxes can be constructed either with or without floors. Without floors (bottomless boxes) fit directly onto the concrete floor and thus the nesting material is placed directly onto the floor. The advantage of this design is that when the box is moved for cleaning at the end of lay the used nesting material remains and is removed with the floor litter. A bottomless box is also much easier to clean and can save washing time by up to 50%.

Whilst bottomless nest boxes have some advantages (easier to clean and no alighting board required) they can be more difficult for farm staff to collect eggs and monitor broodiness due to being placed directly on to the floor. These problems can be alleviated by either lowering the house passageway between the nest boxes (figure 6) or by placing them onto a raised concrete platform (figures 7 and 8).

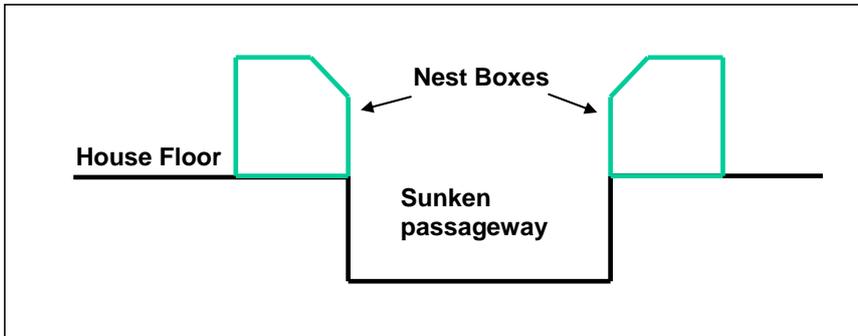


Figure 6: House passageway between nest boxes is lower

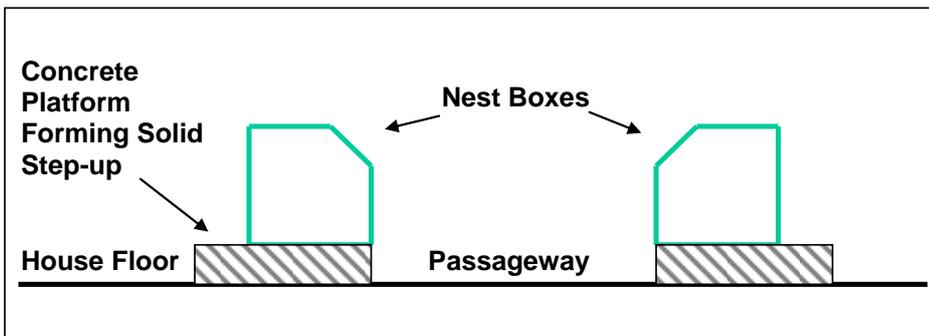


Figure 7: Nest boxes are placed on raised concrete platforms



Figure 8: Plastic nest boxes placed on raised concrete platforms

AUTOMATIC NEST BOXES

Automatic nest boxes are a large capital investment for a finite period of 20 to 25 years so it is imperative to combine them with high standards of management to optimise return on investment. Examples of commonly used automatic nest systems for turkey breeders are those manufactured by MGH and Vencomatic (figures 9, 10). Systems produced by other manufacturers are also available. Before deciding which automatic nest system to acquire, consider its design and operation from the perspective of bird welfare. It is also wise to seek advice from the manufacturers and experience from other farmers.



Figure 9: Vencomatic nest open (middle) and closed (right and left)*

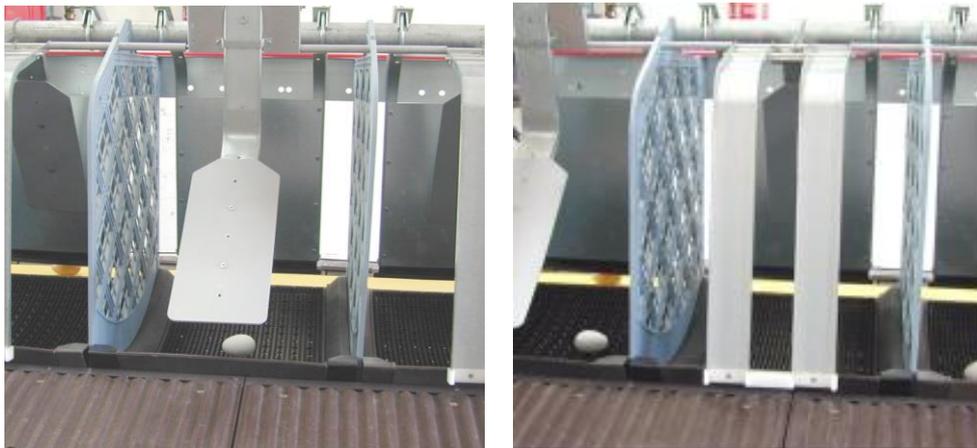


Figure 10: MGH wide nest open (left) and closed (right)*

The systems produced by Vencomatic and MGH work differently with regards to trap mechanism, bird push-off from the nest and egg collection.

MGH traps can be closed as required whilst Vencomatic traps are continuously open at all times. The MGH trap operates by the bird pushing the nest trap paddle on entering the nest which closes the trap behind the bird; the bird can exit easily when she wants to. The Vencomatic trap closure is triggered by the weight of the bird on the nest floor on entering the nest.

Bird push-off in the Vencomatic is accomplished by raising the nest floor which also rolls the egg onto the belt at the front of the nest. In the MGH nest the rear panel of the nest pushes the bird off and a flap at the bottom of the panel rolls the egg onto the belt when it returns. The push-off process takes 90-120 seconds to prevent bird stress and damage to the egg.

The egg belt for the Vencomatic nests is at the front of the nest under the front step-up and with the MGH nest the belt is accessible from the rear of the nest.

It is important to consider the design and angle of ramps used with auto-nests. The ramp height relative to the nest should allow easy entry and exit for the females. Ramps must not cause the female to become unbalanced when exiting the nests and walking down the ramp to the floor area or walking along the ramps looking for a nest to lay in.

Positioning of nests

Ideally sheds should be no more than 14 metres wide which facilitates 2 rows of nests positioned length-ways down the shed.

Nests should be in a darkened area of the house or the nests need to be darkened at the start of production. Further details for the positioning of nests and lighting within the shed can be obtained from the manufacturers.

In open-sided houses nest boxes should be positioned in the centre of the shed so they are protected from the wind, rain and direct sunlight. In closed environment sheds nests can be placed near the outside walls. There are positives and negatives to nest box positioning which are listed in table 2.

Nests placed along the outside wall	Nests placed in the centre of the shed.
<ul style="list-style-type: none"> • The nests can be exposed to wind and rain if curtains are not used in open sided houses. • Requires 2 passageways which reduces the bird area and makes routine maintenance more difficult. • Reduces the amount of wall space which in turn reduces dark areas where the birds may lay eggs on the floor. 	<ul style="list-style-type: none"> • Increases the available floor area. • Can increase floor eggs laid against the outside walls. This can be minimised by increasing illumination in this area e.g. painting the walls white to increase the light intensity/distribution. • Routine maintenance of the nests is easier.

Table 2: Positives and negatives of nest box position

NEST BOX MANAGEMENT

PRE-STOCKING PREPARATION

Ensure that the nests and mats have been cleaned and disinfected as part of the house cleaning process prior to the arrival of the new flock.

Manual nests require a suitable nesting material. There are a number of different materials that can be used, all should be free of dust, dry and clean. Dust free wood shavings are the best material but it is the most expensive. Good quality field straw which is dry and free from dust can be used but should be stored in a clean dry, vermin proof, bio secure storage area. Other types of nesting materials that can be used dependent on availability are rice hulls and coconut shells. At least 8 cm depth of nesting material is required in the box and it will need to be topped up regularly and contaminated material removed, especially at the start of the laying period when there is an increased level of nesting activity.

Ensure that proper maintenance and testing of the nests has been carried out. For auto-nests, always refer to the manufacturer’s guideline on maintenance.

Ensure that the planned female stocking density is correct for the house area and that you have sufficient nest boxes for the females to prevent floor eggs and maximise production of good quality settable eggs. Table 3 shows the recommended number of females per nest box for heavy and medium breeds.

Breed Type	Females per Nest Box
Heavy	4.5 – 5
Medium	5 – 5.5

Table 3: Nest box provision for females at housing.



Insufficient nest boxes can reduce settable egg numbers by increasing the number of floor eggs, the number of broody birds and reject eggs.

Ensure that the alighting ramps are clean, at the correct height for the strain and, if sloped, that the incline is not too steep, to prevent females slipping.

TRAINING FEMALES TO USE NESTS

The time between lighting and peak production is the most important period for acclimatisation of the females to their new environment and training them to use the nests. Training the females to use the nests will help to reduce the number of females laying eggs on the floor. As every flock is different in character there needs to be a flexible approach to management during this period and in this respect the information below must be viewed as a guide only.

As is often the case with turkeys it is best to introduce new things or make changes to existing routines gradually. This is especially the case when training females to use the nests. As with many areas of poultry husbandry there is more than one method for training the females to use the nests. Auto-nest manufacturers publish recommendations for flock training. This Technical Advice Sheet deals with the training methods preferred by Aviagen Turkey based on the wide practical experience gained by our management specialists in the field.

During the first week of egg production, the females must be encouraged and trained to use the nest boxes. Proper training of the females will reduce the incidence of floor eggs and broody females. The incidence of floor eggs is a good measure of the success of nest box training and should not exceed 1% of total egg production.

Visit the laying house four or five times per day to familiarise the birds to daily activities. Do not walk through the passageways as this will disturb the birds whilst they are learning to use the nests.

Do not add litter to the floor area during the training period. The aim is to try to not add floor litter to the pen from transfer to peak of production. Adding new floor litter will deter the birds away from the nest box and will encourage the females to lay on the pen floor.

Manual nest training

- Make nests available 24 hours per day beginning no later than 7 days post-lighting.
- Traps should be either tied open or completely removed from the nest entrance (depending on trap mechanism) until egg production reaches 25% to 35%. Easily accessible nest boxes will encourage the female to enter the nest.
- Reinstate the traps gradually into the working position over a period of 3 to 4 days.
- If you observe an increase in floor eggs during this time, reduce the number of traps being untied into the working position to keep the nests as easy to enter as possible.
- Eggs should be collected and hens pushed off the nest. The frequency of egg collections should be increased gradually as egg production increases.

Automatic nest training

The nests, but not the pen area, must be darkened at the start of production to attract the females to the nests. This can be achieved by lowering the light intensity above the nests or providing some additional shading on top of the nest.

The nest-box opening and closing mechanism should be run twice per day. This practice will help familiarise the birds to the operation of the nest mechanism and avoid any stress associated with its activation. Automatic nest boxes should be closed at night. As soon as the hens are in the laying house the nest should be opened 30 minutes after lights on and closed 30 minutes before the lights switch off. This will avoid the birds sleeping in the nest at night and prevent the mats becoming dirty.

The nest control unit can be set to either manual or automatic push-off. At the start of lay it is preferable to use the manual setting so push-offs can be customised to the rate of lay, switching to automatic timed push-offs between days 10-12 of production. When the system is on a manual setting, the stockman should assess the level of nest box activity to determine when to push-off the females and collect the eggs. Gradually increase the number of push-offs from the nests as the egg production increases, see example in Table 4.

Egg Production %	Number of push-offs and egg collections per day
10	2
20	4
30	6
50	8
70	10
80+	12+

Table 4. Example of push-off and egg collection programme

NEST BOX OPERATION DURING PRODUCTION

At peak of production the light intensity above the nests should be the same as the rest of the house.

A clean nest box is important in helping prevent the microbiological contamination of eggs. Nesting material should be changed regularly to stop a build-up of contaminating material. If matting is used it should also be removed, cleaned and replaced into the nest box at regular intervals. Cleaning usually commences at the end of the 5th week of production but maybe be earlier if required. Cleaning should ideally take place at the end of the daily laying period.

Eggs should be collected and hens pushed off the nest at least 8 times per day starting from 2 – 2.5 hours after lights-on. The programme for egg collections should be adjusted with changes in egg production. During the daily peak of egg production it may be necessary to collect more frequently than once an hour. It would also be wise to consult the manufacturer for their recommendations.

Record the number of eggs laid at each collection and categorise them into nest and floor eggs and then into clean settable, dirty, cracked, misshaped, thin shells small and large. These records will help the farm manager assess the adequacy of the egg collection programme and make necessary adjustments.

Infrequent egg collections can result in an increase in the incidence of broodiness, dirty eggs and lower egg production. Eggs should be collected more frequently in either very hot or cold weather otherwise hatchability can be adversely affected.

The females should be pushed off the nest to discourage broodiness at each collection. It is important to collect floor eggs to discourage broodiness at least every time a ramp push-off is conducted and as often as every 30 minutes during the daily peak of egg production. Floor eggs should be collected and handled separately from nest eggs to prevent possible cross contamination.

Generally, at around 70% of production, results will be improved if females are gently pushed away from the ramps during the daily peak of egg production to allow other birds to enter the nest. This should be done once or twice per day and more frequently from 3 weeks to around 18 weeks of production. The frequency of ramp push-aways (normally 6 - 8 times per day) depends on the amount of birds requiring the nests and should be focused on the time of peak lay. One final ramp push-away should be conducted 30 minutes before lights off to avoid hens sleeping in front of the nest. Ramp push-aways should be done gently and carefully so as not to stress the birds which could result in an increase of reject eggs.

Additional Guidelines for Automatic Nest Operation

An example of an egg collection programme for automatic nests is shown in Table 5. The programme for ejections should be flexible and evolve with the rate of increase in egg production. Do not allow the belt to run until all eggs are safely on the conveyor.

Time	Action
4	Lights ON
4:30	Open nests
5:30	Push-off
6:30	Push-off
7:30	Push-off + Ramp Push-Away
8:30	Push-off + Ramp Push-Away
9:15	Push-off + Ramp Push-Away
10:00	Push-off + Ramp Push-Away
11:00	Push-off + Ramp Push-Away
12:00	Push-off + Ramp Push-Away
13:00	Push-off + Ramp Push-Away
14:00	Push-off
15:00	Push-off
16:00	Push-off
17:00	Push-off
18:00	Push-off + Ramp Push-Away, close nests
18:30	Lights OFF

Table 5 Example of an automatic nest management programme

Where multiple rows of nests are installed in the house, operate the rows of nests sequentially. This will allow farm staff to push-away the females from the ramps before the next set of nests pushes-off the females. It also allows females wanting to lay an egg to continue to find an open nest. It is recommended that the nests are closed for a maximum of 3 to 4 minutes which should be sufficient time for the farm staff to push the females away from the ramps.

Nests can be closed for a 30 minute period during each day in the afternoon, when egg production is at its lowest. This will encourage the hens to feed and drink and discourages them from sitting in the nests for long periods. It is not advisable to close nests in the morning, as this will cause egg production to start later in the day.

*We gratefully acknowledge the pictures provided by MGH and Vencomatic.

Information presented in this article combines the collective data derived from internal research trials, published scientific knowledge, and the expertise, practical skills and experience of the Aviagen Turkeys' Customer Support Team. For further information on raising turkeys, contact your local Customer Support Manager or Aviagen Turkeys directly.

Whilst every attempt has been made to ensure the accuracy of the information presented, Aviagen Turkeys accepts no liability for the consequences of using this turkey management information.



Aviagen Turkeys Ltd.

Chowley Five, Chowley Oak Business Park, Tattenhall, Cheshire CH3 9GA

Tel: +44 (0)1829 772020 **Fax:** +44 (0)1829 772059

Web: www.aviagenturkeys.com

