



Ranger Parent Stock Female



MANAGEMENT SUPPLEMENT

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An Aviagen Brand



Introduction

The Ranger™ female is a brown-feathered female which can be crossed with a range of males to produce slower-growing broilers for the Rowan Range®. The Rowan Range is a range of specialty broilers offering varying growth rates and feather color to meet the needs of selected broiler markets, including the slower-growing, free-range, and organic markets. Birds from the Rowan Range have excellent health and welfare characteristics, as well as excellent performance for meat production.

The Ranger female is a standard size female with excellent reproductive traits, good chick quality and robustness, but as part of the slower-growing product portfolio has some key management requirements. The purpose of this document is to provide advice on how to appropriately manage the Ranger female. The information provided is based on a combination of data from trials, and the expertise and practical knowledge of Aviagen® representatives. It should be used in conjunction with, and as a supplement to, the local **Parent Stock Handbook** supplied by Aviagen.

Rearing (0 to 20 weeks)

General management practices for the Ranger female in rear are not different to those for standard Aviagen parent stock females and further information can be found in the **Parent Stock Handbook**. However, there are some key areas of management for the Ranger female to which particular attention should be paid and these are detailed below.

Brooding Management

It is important to get the Ranger female off to a good start through the use of good brooding management practices. The brooding set up must primarily develop appetite by providing easy access to feed, water, heat and light (**Figure 1**).

Figure 1. Good brooding set-up showing adequate access to feed, water and light and where the temperature is correct. Chicks are evenly spread throughout the entire brooding pen, eating, drinking and vocalizing contentedly. There is no evidence of panting or huddling.



Achieving the correct environmental temperature is key to getting the birds off to a good start and recommended environmental conditions (**Figure 2**) must be achieved at least 24 hours prior to chick placement.

Figure 2. Recommended environmental conditions for chick arrival.



Table 1. Recommended temperature profile and principles of how the dry bulb temperature may need to be altered in situations where RH% deviates from the ideal (given in red). The figures are a guide only and house temperature at chick level should be adjusted in accordance with chick behavior to ensure chick comfort is maintained.

Age (days)	Dry Bulb Temperature at RH%			
	°C (°F)			
Day-old	40	50	60	70
3	36.0 (96.8)	33.2 (91.8)	30.8 (87.4)	29.2 (84.6)
6	33.7 (92.7)	31.2 (88.2)	28.9 (84.0)	27.3 (81.1)
9	32.5 (90.5)	29.9 (85.8)	27.7 (81.9)	26.0 (78.8)
12	31.3 (88.3)	28.6 (83.5)	26.7 (80.1)	25.0 (77.0)
15	30.2 (86.4)	27.8 (82.0)	25.7 (78.3)	24.0 (75.2)
18	29.0 (84.2)	26.8 (80.2)	24.8 (76.6)	23.0 (73.4)
21	27.7 (81.9)	25.5 (77.9)	23.6 (74.5)	21.9 (71.4)
24	26.9 (80.4)	24.7 (76.5)	22.7 (72.9)	21.3 (70.3)
27	25.7 (78.3)	23.5 (74.3)	21.7 (71.1)	20.2 (68.4)
	24.8 (76.6)	22.7 (72.9)	20.7 (69.3)	19.3 (66.7)

Environmental temperature recommendations after placement are given in **Table 1**.

Other key management points during brooding include;

- Monitoring actual chick behavior to determine if house temperatures are correct. If bird behavior indicates that temperatures are too hot (chicks are spread out, panting and no vocalization) or cold (chicks huddling together or around the brooder, distress-calling) then appropriate adjustments to the environment must be made. A brooding pen used for the first 3-7 days of life will help to keep chicks near the heat source, feed and water.
- Fresh litter, free from dust, should be spread to a depth of 2-5 cm (0.8-2 in). If floor feeding is practiced litter depths should not exceed 4 cm (1.6 in).
- Birds must have an easy and plentiful access to fresh, clean water from placement. Supplementary drinkers should be used during the first 3 days after placement to encourage water intake (**see Figure 1**).
- During the first 24 hours walking through the flock when checking crop fill and replenishing the feed on the paper will create activity in the flock, stimulating the chicks to feed and drink. This is particularly important where transport times have been longer.
- Monitor crop fill regularly during the first 48 hours after placement. The crop should be full, soft and rounded in chicks that have found food and water (**Figure 3**). If the crop is full, but the original texture of the crumb is still apparent, the bird has not yet consumed enough water. Guidelines for target crop fill in the first 48 hours are given in **Table 2**.

Figure 3. Assessing crop fill. The chick on the left has found feed and water and has a full crop. The chick on the right has an empty crop.



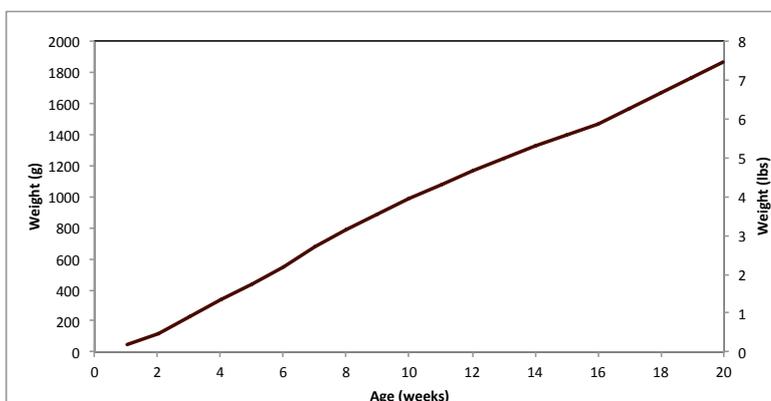
Table 2. Target crop fill assessment guidelines.

Time of Crop Fill Check After Placement	Target Crop Fill (%age of Chicks with Full Crop)
2 hours	75
8 hours	>80
12 hours	>85
24 hours	>95
48 hours	100

Body-weight Profile

The Ranger female is early maturing. The recommended body-weight profile in rear takes account of this to allow birds to achieve 5% egg production at 23 weeks of age (see **Figure 4** and the **Parent Stock Performance Objectives** for more details). If birds are fed to achieve recommended body weights they will achieve the correct maturity at point of lay (POL). Weekly weight gains of 20% or more between 17 and 22 weeks should be avoided as this will result in birds coming into lay early leading to a high number of small eggs.

Figure 4. Body-weight profile for the Ranger female in rear.



Grading is a key management strategy for the Ranger female; a high flock uniformity is necessary to ensure that early performance is optimized and persistency of production maintained. Minimizing variation within a flock will make management easier as all birds will respond in a similar way to management factors such as light stimulation and increased feeding. Grading is best carried out between 29 and 35 days of age and the flock should be split into sub-populations depending on variation in body weight within the flock at the time of grading. After grading each sub-population should be managed separately according to its weight with the aim of bringing all populations back to target by point of lay.



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- The actual grading procedure will depend on house set-up (flexibility of penning and feeding system set-up) and variation in body weight at the time of grading.
- Space allocated for both males and females must be capable of being divided up into 2 or 3 pens.
- Prior to grading a sample of birds must be weighed and the variation in body weight established so that grading cut-offs and number of sub-populations required can be determined.
- After grading, a sample of birds from each sub-population must be re-weighed and number of birds in each pen counted to ensure correct future management practices.
- Correct stocking density and feeder and drinker space **MUST** be maintained in graded populations.
- Body weights from graded populations should be plotted against targets and profiles re-drawn where necessary to bring birds back on target by ideally 63 days of age but by POL at the latest. Feed levels should be determined by deviation of body weight from target.

It is good management practice to complete routine weekly weighing to closely monitor body weight throughout the life of the flock. This will help to ensure birds remain on target and allow any deviations in body weight to be identified promptly so that appropriate management strategies can then be put in place (for example changes to feeding management or feeder space and height) to correct them.

Feed Management

Feed management for the Ranger female is the same as that for other standard Aviagen parent stock females. The key points are:

- A sieved crumble or mini-pellets should initially be provided in feeder trays (1 for every 80-100 birds) and on paper spread across the brooding area.
- Where track feeding or pans are used birds should be gradually introduced to the automated system from 8 days of age onwards. Full transfer to the automated feeding system should occur over a 2-3 day period during which time the amount of feed in the automated system should be gradually increased. During the transitional period to the automated system, manual feeding should continue.
- Where spin feeders (floor feeding) are used, population size per spinner should be no more than 1000-1500 birds, depending on the pen shape/spinner type. Pellets should be of good physical quality, and a pellet with 2.5–3.0 mm diameter and 3-4 mm length should be used.
- The transition to floor feeding must be well managed. A typical well managed transition from hand feeding to spin feeding and from crumble to pellet feeding is given in **Table 3**.
- With floor feeding it is also important to pay particular attention to feed clean-up time. Birds should clear up all feed; no feed should be left in litter. Any feed left in the litter may be found by the flock later on leading to problems with body weight control. Check for feed in litter regularly. If feed is found in the litter feed levels may need to be amended depending on body weight.
- Monitor feed depth, distribution time and clean-up time routinely at several points around the house.

Table 3. A typical transition from hand feeding to spin feeding.

AGE (days)	FEED FORM	FEEDING	
		Hand	Spinner
1-13	CRUMBLE	100%	-
14	CRUMBLE / PELLET	100%	-
15	CRUMBLE / PELLET	100%	-
16	PELLET	100%	-
17	PELLET	75%	25%
18	PELLET	50%	50%
19	PELLET	25%	75%
20	PELLET	-	100%
21	PELLET	-	100%



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- If track feeders are used all feed should be distributed to each population within 3 minutes. If feed distribution is a problem, distribution time can be reduced by placing a supplementary feed hopper halfway around the feeder loop.
- Pan feeders provide good feed distribution if managed properly. Pan feeders must be checked regularly to ensure that all pans are receiving feed and that the lines remain charged.
- Alter the height of feeders and drinkers with bird growth. Correct feeder height will optimize bird access and feed intake, minimize feed spillage and prevent feeders from becoming contaminated with litter. Monitor feeding and drinking behavior to ensure feeder and drinker heights are correct for bird age.
- The Ranger female can take longer to consume the allocated feed amount, particularly in the first 5 weeks of life. As long as body weights remain on target this is not an issue. Any changes in feed clean-up time trends or deviations from body weight target should be investigated immediately.

Lighting Programs

The Ranger female is early maturing by nature. It is also much more responsive to light stimulation than other standard Aviagen parent stock females. It is recommended that light stimulation should occur around 147 days or 21 weeks (**Table 4**). However, the actual age at which photo stimulation occurs will depend on the average flock body weight and flock uniformity. If the flock is under weight (~100g) or uneven (CV% > 10) at time of light stimulation, then the first light increase should be delayed by a week.

Table 4. Lighting programs for controlled environment rearing to controlled environment laying to achieve 5% at 23 weeks of age.

Age		DAY LENGTH for flocks with different CV% at 133 days (19 weeks)		LIGHT INTENSITY †
		BROODING DAY LENGTH (hours)		
(days)	(weeks)	CV 10% or less	CV greater than 10%	
1		23	23	80-100 lux (7-9 foot candles) in brooding area 10-20 lux (1-2 foot candles) in the house
2		23	23	
3		19	19	
4		16	16	
5		14	14	
6		12	12	
7		11	11	
8		10	10	
9		9	9	
		REARING DAY LENGTH (hours)		
10-146		8	8	10-20 lux (1-2 foot candles)
		LAYING DAY LENGTH (hours)		
(days)	(weeks)			30-60 lux (3-6 foot candles)
147	21	11‡	8	
154	22	12	12‡	
161	23	13	13	
168	24	13	13	
175-depletion	25-depletion	13	13	

† Average intensity within a house or pen measured at bird-head height. Light intensity should be measured in at least 9 or 10 places and include the corners, under lamps and between lamps. Ideally, the standard error should not exceed 10% of the mean.

‡ The day length may be increased abruptly in a single increment from 8 to 13 hours without adversely affecting total egg production provided the body weights are on target and the flock is uniform (CV ≤ 10%). An abrupt increase in day length induces a higher peak rate of lay, though with slightly poorer persistency, to that expected for a program involving a series of increments. However, total egg production for the two types of lighting programs will be similar.



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As with all standard Aviagen parent stock, birds in closed houses should be reared on short days of 8 hours from 10 days of age. If birds are reared in open-sided houses then they should be allowed to experience whatever the natural day length is. However, it is important to monitor body weight and feed clean-up times (as the Ranger female can have slower eating up times). If body weight is below target then age at which light is reduced to 8 hours may need to be delayed by a few days. The exact delay will depend on the individual flock circumstances (body-weight, feed clean-up times etc.) and care should be taken to ensure birds still receive the adequate period of short days prior to light stimulation so that they can respond to the light stimulation when it is given.

Peak day length for the Ranger female in lay should not exceed 13 hours of light per day. In case of excessive floor eggs it might be helpful to increase day length by 1 hour to 14 hours. Further increases in day length will advance the onset of adult photorefractoriness and result in inferior rates of lay at the end of the laying cycle. In open-sided houses day length will vary according to placement date and natural day length patterns. If the longest natural day length in lay is expected to exceed 13/14 hours, the combination of natural and artificial light should be increased to equal the expected longest natural day length. It is important that birds do not experience a reduction in day length during lay.

The development of pin-bone spacing should be monitored weekly in the period leading up to expected first egg (from 15 or 16 weeks of age onwards). Measurement of pin-bone spacing (and secondary sexual characteristics such as body condition) provides a good indication of sexual development. If pin-bone spacing does not develop as indicated in **Table 5** (i.e. is below 1½ fingers or 2-3 cm at the intended age of light stimulation), or if there is a big variation in pin-bone spacing within the flock, then light stimulation should be delayed.

Table 5. Changes in pin-bone spacing with age.

Age	Pin-Bone Spacing
84-91 days	Closed
119 days	1 finger
21 days before first egg	1 ½ fingers
10 days before first egg	2-2 ½ fingers
Point of lay	3 fingers

Sexing Errors

Due to the early maturing nature of the Ranger female it is important that sexing errors (**Figure 5**) are identified and removed as soon as possible.

Figure 5. Example of male sexing error at 6 weeks old.



Laying Period (21 weeks to depletion)

Managing Stock Transfer

Transfer of stock to the laying facilities must be managed with appropriate care. Extra feed (approximately 50% more) should be given on the day before and the day of transfer. Feeding space must not be reduced and lighting programs and biosecurity should be synchronized between rearing and laying houses.

An assessment of crop fill on the day of transfer, 30 minutes after the first feed and then again 24 hours later will provide an indication of whether or not birds have found feed and water after transfer (**Figure 6**). If crop fill is found to be inadequate (ideally all birds should have a full crop) the reason for this needs to be established (e.g. inadequate feeder space, feed distribution or availability of feed) and corrected as soon as possible. Continue to check crop fill an hour after feeding for the first 3 days after transfer, to make sure all the birds are finding the feed and water.

Figure 6. Photo of crop fill after transfer.



Water should be freely available to the birds as soon as they arrive at the laying facilities. Running track or pan feeders in the dark (i.e. turning the lights off to fill them for the first time) will aid with feed distribution.

Moving birds to the laying house should be scheduled so that all the birds have time to find both feed and water in their new housing before the lights are turned off at night.

Several days after transfer it is advisable to start running the egg collection belt so the birds become accustomed to the noise and movement of the belts. This will encourage nest use when laying begins, reducing the incidence of floor eggs.

Feeding Into Production

Monitoring body weight and providing appropriate feed increases into production is important with the Ranger female. The difference in feed quantity allocated prior to first egg and the target feed level given at peak allows a feed allocation schedule into production to be established. An example feeding program to peak for the Ranger female can be found in the

Parent Stock Performance Objectives. Up to 5% production birds should be fed according to body weight and peak feed should be given at 60-70% production.

Actual feed amounts up to and at peak should be adjusted for each individual flock depending primarily on body weight, daily egg production, daily egg weight and uniformity. The following should also be taken into account;

- Feed clean-up time
- Energy density of the feed
- Egg weight and change in egg weight
- Environmental temperature

Responsive management of birds coming into production requires frequent observation and measurement (ideally daily) of the production parameters given above. The feed increases given must be adjusted appropriately to support production and feed increases beyond recommended peak feed amounts may be required in high producing flocks. Small but frequent feed increases to the peak feed amount should be given to ensure that desired body-weight gains are achieved.

Feeding After Peak

Feeding after peak is the area of management that will have the biggest impact on persistency of lay and hatch and needs to be handled with care. The principles of managing feed levels after peak are the same for the Ranger female as for any other standard Aviagen female, but it is important to note that the feed withdrawal required after peak is lower for the Ranger female being around **2.5-3%**. The timing and exact amount of feed required after peak, will depend on observations and measurements of bird condition in the first instance and the following characteristics should be measured, recorded and graphed onto a chart to aid with decision making;

- Daily (or weekly) body weight and body-weight change relative to the target.
- Daily egg weight and egg-weight trend relative to the target.
- Daily changes in feed clean-up time.



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The following observations should also be taken into account when considering required feed allowance after peak;

- Body weight and body-weight change from the start of production.
- Daily egg production and the hen-day production trend.
- Changes in feed clean-up time.
- Daily egg weight and egg-weight trend.
- Egg mass trend.
- Health status of the flock and feathering condition.
- Ambient environmental temperature.
- Feed composition i.e. feed texture, including energy and protein levels.
- Quantity of feed (i.e. energy and protein intake) at peak.
- Flock history (i.e. rearing and pre-peak performance).

Seasonal variations in temperature will also influence feed levels after peak. A flock peaking in winter will require more feed to support the demands of egg production in cooler temperatures, but will deplete in warmer weather and so may require more feed to be withdrawn than a summer peaking flock which depletes in colder weather.

Nutrition

It is recommended that the Ranger female is reared on a 4-stage rearing program. This will support bird growth and development as well as good feather cover.

The breeder feeds for the Ranger female are formulated to optimize overall breeder production and support egg shell quality.

Conclusions

While basic management practices for the Ranger female do not differ to standard Aviagen parent stock females there are some key management requirements that need to be noted for the Ranger female.

- Appetite development through good brooding practices is key.
- The Ranger female is early maturing and management practices must account for this.
- Birds should be managed to achieve 5% production at 23 weeks of age. Following the recommended body-weight profile and nutrition specifications will ensure birds are at the correct maturity at point of lay.
- Sexing errors should be removed as early as possible.
- Feed increases coming into production must account for rapid increases in early production.
- Changes to feed levels between peak egg production and depletion are lower for the Ranger female.
- The Ranger female can take longer to consume the allocated feed amount.



Every attempt has been made to ensure the accuracy and relevance of the information presented. However, Aviagen accepts no liability for the consequences of using the information for the management of chickens.

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