Management Supplement

2014

ROSS
An Aviagen Brand

Managing the Ross® PM3

Kris Van Daele – Commercial Technical Manager

Introduction

The Ross PM3 breeder was first introduced into France in the mid 1980´s. Recently it has been introduced into a number of other, mainly European, countries as its popularity increases where space is at a premium and feed costs are high.

The purpose of this document is to provide an update on how to appropriately manage the Ross PM3 and to highlight where management advice for the Ross PM3 differs from that for the Ross 308. The advice covers parent stock, hatchery, nutrition and broiler management.

The information presented is a combination of data derived from trials and the expertise, practical experience and knowledge of the Aviagen Technical Service Teams. It should be use in conjunction with and as a supplement to the 2013 Ross Parent Stock Handbook.

Further information on the Ross PM3 can be obtained from:

- Ross PM3 Parent Stock Performance Objectives, 2014
- Ross PM3 Parent Stock Nutrient Specifications, 2014
- Ross PM3 Broiler Performance Objectives, 2012
- Ross Parent Stock Handbook, 2013
- Ross Broiler Handbook

Parent Stock Management

Basic management practices for Ross PM3 parent stock are the same as those for Ross 308 parent stock. Further general guidance on how to manage the Ross PM3 breeder can be obtained from the Ross Parent Stock Handbook 2013. The nutrient recommendations given in this document refer to the Ross PM3 Nutrient Specifications 2014.

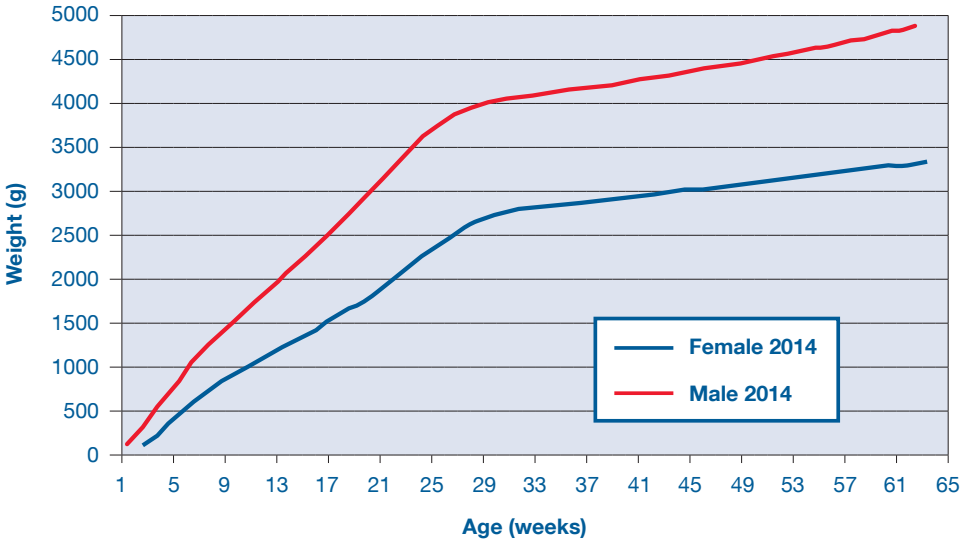
Rearing 0 to 20 weeks

In rear the Ross PM3 requires the same care and attention to detail as the Ross 308. Good brooding practices are necessary to get the birds off to a good start. Thereafter, ensuring birds follow the target body-weight profiles will mean that they grow and develop correctly so that reproductive performance is optimized in lay.

Body-weight profiles

The current (2014) body-weight profiles for the Ross male mated with the Ross PM3 female and the Ross PM3 female are given in Figure 1.

Figure 1. *Body-weight profiles for the Ross PM3 female and the Ross male to be mated with the Ross PM3 female.*



For the first 6 weeks of age the growth profile for the Ross PM3 female is similar to that for the Ross 308 female (Figure 1); this ensures good early growth and skeletal development. In lay weekly increases in body weight support the potential growth, egg production and fertility of the Ross PM3 female.

The body-weight profile recommended for the Ross male mated to the Ross PM3 female (Figure 1) is lighter in production than the body-weight profile of the standard Ross male. The Ross PM3 female is a dwarf bird and the body-weight profile of the male must account for this.

Lighting programmes

The basic principles for lighting the Ross PM3 breeder are the same as those for the Ross 308. However, management practices for the Ross PM3 favour achieving 5% production at 23 weeks of age and so the age at which the first light stimulation is given must be adjusted accordingly. To achieve the recommended 5% production at 23 weeks of age, light stimulation should occur around 147 days or 21 weeks of age (Table 1). However, the actual age at which light stimulation occurs will depend on average body weight and flock uniformity. If birds are below target weight (by 100g or more) or the flock is not uniform (CV greater than 10) then light stimulation should be delayed (by at least one week).

Table 1. *Lighting programmes for controlled environment rearing to controlled environment laying to achieve 5% at 23 weeks of age.*

		DAYLENGTH for flocks with different CV% at 133 days (19 weeks)		LIGHT INTENSITY†
Age		BROODING DAYLENGTHS (hours)		
(days)	(weeks)	CV 10% or less	CV greater than 10%	
1		23	23	80-100 lux in brooding area 10-20 lux in the house
2		23	23	
3		19	19	
4		16	16	
5		14	14	
6		12	12	30-60 lux in the brooding area 10-20 lux in the house
7		11	11	
8		10	10	
9		9	9	
		REARING DAYLENGTHS (hours)		
10-139		8	8	10-20 lux
(days)	(weeks)	LAYING DAYLENGTHS (hours)		
147	21	11‡	8	30-60 lux
154	22	12	12‡	
161-depletion	23-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 daylength 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 daylength induces a higher peak rate of lay, though with slightly poorer persistency, to that expected for a programme involving a series of increments. However, total egg production for the two types of lighting programme will be similar.

Note: Typically, it will take between 14 and 21 days from photo stimulation to 5% egg production, with lighter birds taking longer to start laying eggs than heavier ones.

The Ross PM3 female is more responsive to light stimulation than the Ross 308 female. Birds that are transferred from a controlled environment/blackout house in rear to an open-sided house in lay will react to light stimulation quickly and can come in to production rapidly. In this situation it becomes even more important that birds are at the recommended body weight at transfer (see Figure 1) so that the rapid onset of production is supported and persistency of egg production maintained.

In lay, where the environment is fully controlled, 14 hours of light a day should not be exceeded. In open-sided housing where the longest daylength may be greater than 14 hours the combined natural and artificial lighting during lay should be increased beyond 14 hours to equal the longest expected natural daylength. This prevents a decrease in daylength after the longest natural day has occurred in mid-summer, which will have a negative impact on performance.

Laying Period

Feeding into production

Monitoring body weight and egg production and providing appropriate feed increases into production is important with the Ross PM3.

Table 2 shows the recommended feeding programme into lay for the Ross PM3.

Table 2. *Differences in feeding into lay programmes between the Ross PM3 and the Ross 308. Feed amounts given in the Table are based on current Ross PM3 and Ross 308 Nutrient Recommendations and Performance Objectives.*

Weeks / % production	Feed (g) for PM3 females	Feed (g) for 308 females
18 weeks	80 g	87 g
19 weeks	87 g	94 g
20 weeks	94 g	102 g
21 weeks	99 g	108 g
22 weeks	103 g	117 g
5% production	106 g	127 g
10% production	110 g	140 g
20% production	116 g	150 g
30% production	126 g	155 g
40% production	132 g	160 g
>50% production	148 g	165 g

The procedure for determining feed increases into lay is primarily determined by body weight, daily egg production, daily egg weight and uniformity. The feed increases given must be appropriately adjusted to support production and feed increases beyond recommended peak levels may be required in high producing flocks. Small but frequent feed increases should be used to prevent excessive weight gain.

Feed reduction after peak

After peak feed has been given and peak egg mass (egg mass = (hen week (%) x egg weight) / 100) has occurred, feed reductions will be required in order to achieve the recommended target body-weight and to limit the rate of fat deposition as egg production declines (Table 3). Feed withdrawals after peak need to be handled with care. This is the area of management that will have the biggest impact on persistency of lay and hatch. The Ross PM3 female is smaller than the Ross 308 female, and has lower body reserves. Flocks can therefore react adversely to sudden changes in nutrient intake, so any feed withdrawal after peak production needs to be done slowly and with care.

Table 3. *Differences in recommended feed reductions for the Ross PM3 and the Ross 308 female based on current Nutrient Specifications and Performance Objectives.*

Weeks	Feed for PM3 females	Feed for 308 females
30	148 g	167 g
60	137 g	158 g
Feed reduction %	7.4%	5.4%

Feed reductions after peak should maintain female body-weight gains at around 17g per week; this will ensure good persistency by managing egg weight gains and therefore egg mass. The actual feed reduction given should be based on observations of:

- Body weight
- Egg production
- Feed clean-up time
- Egg weight
- Egg mass
- Health status
- Ambient temperature and feathering condition
- Feed composition
- Feed amount
- Flock history (rearing and pre-peak performance)

Stocking Density

Stocking density can be higher for Ross PM3 than for Ross 308 due its smaller size. Recommended stocking density for the Ross PM3 is 7.5 – 8 birds per m^2 (including males), but actual stocking density may vary from this depending on welfare regulations, economics, environment and actual available floor, feeding and drinking space. It is important that the environment and management conditions (feeding and drinking space) are appropriate for the stocking density used if negative effects on performance are to be avoided.

Nest Space

The Ross PM3 female takes slightly longer to lay its egg than the Ross 308 and so will occupy the nest space for longer. It is recommended therefore to provide increased nest space for the Ross PM3 (i.e. reduce the number of birds per linear meter of nest space). This will also help to prevent floor eggs.

- Ross 308 recommendation: 80 birds per linear meter nest
- Ross PM3 recommendation: 75 birds per linear meter nest

Male management

Good male management is a key part of ensuring optimal reproductive performance in the Ross PM3 female. The management practices for the male mated with Ross PM3 female are not different to those used for the male mated with the Ross 308 female and more details on appropriate male management can be obtained from the Ross Parent Stock Handbook, 2013.

Nutrition

Nutritional recommendations for the Ross PM3 female are different to those for the Ross 308 female with respect to premix composition (see Ross PM3 Nutrient Specifications, 2014).

Premix requirements for the Ross PM3 are higher than that of the Ross 308 due to their lower feed intake (Table 2). For females kept on the floor, premix for the Ross PM3 should be 15% higher than that given to the Ross 308.

Broilers

Ross PM3 broiler chicks might be slightly smaller as egg size of the Ross PM3 female is lower than that of the Ross 308. Early environmental temperatures may therefore have to be adjusted (by 1-2°C) depending on chick size and chick behaviour. Other than that Ross PM3 broilers do not need specialised management and they should be managed with the same care and detail to attention as Ross 308 broilers.

Hatchery

Ross PM3 broiler chicks need between 2 and 4 hours less time to hatch. If incubation times are not adjusted accordingly to account for this, broiler performance might be impaired.

To achieve optimum incubation times, the set time for the Ross PM3 should be delayed by 2-4 hours. It is not recommended to shorten the time in the hatchers or lower the incubation temperatures.

The best check of whether or not incubation times are correct is chick yield at take-off. This is calculated as

$$\frac{\text{average chick weight}}{\text{average egg weight at set}} \times 100$$

As with the Ross 308, chick yield at take-off should be around 67% for the Ross PM3. Chicks spending too long in the incubators will be dehydrated and difficult to start on the broiler farm.

The cumulative hatchability for Ross PM3 is 82.3%, this is slightly lower than the cumulative hatchability for the Ross 308 but the economic effect of this lower hatch is reduced due to the increased stocking density of the Ross PM3 (compared to the Ross 308).

Conclusions

The Ross PM3 is increasing in popularity due to its advantages in areas where space is a limiting factor and feed costs are high. It has a lower cost of production than standard strains with excellent chick output and competitive broiler performance (Table 4). Management of the broiler is the same as that for the Ross 308, although early environmental temperatures may need to be increased to account for a smaller chick size. Because the Ross PM3 female is a dwarf female there are some key management differences between the Ross PM3 and Ross 308 at parent stock level. Understanding and accounting for these differences will ensure that performance of the Ross PM3 parent stock female is optimised.

The key points to consider when managing the Ross PM3 parent stock are:

- Birds should be reared maintaining recommended body-weight profiles and adhering to recommended nutrient specifications.
- Feeding into production: Ross PM3 females come into lay quickly and feed increases to peak must account for this. Do not exceed 148 gram for birds kept on the floor (on recommended nutrient specifications).
- Males mated to the Ross PM3 female should be managed with the same care and attention as males mated to the Ross 308 female. Accurate and regular monitoring of body weight and condition is the key to maintaining good fertility.
- Keep to recommended stocking densities and in lay ensure that sufficient nest space is provided.
- The Ross PM3 takes 2-4 hours less to hatch than the Ross 308 and set-times must be altered to account for this if chick quality is not to be affected.

Table 4. *Breeder and broiler performance statistics for Ross PM3 compared to Ross 308.*

Breeder: Summary of 40 weeks production

	Ross PM3	Ross 308
Age at depletion	62 weeks	62 weeks
Total Eggs	180	184
Hatching Eggs	172	176
Chicks/female housed at 23 weeks	141	146
Hatchability %	82.3	83.1%
Age at 5% production	23 weeks	23 weeks
Peak production	85.7	86.3
Body weight at 23 weeks	2305 g	2804 g
Body weight at depletion	3324 g	4117 g
Liveability rear	95-96 %	95-96%
Liveability lay	92 %	92%
Feed/100 Chicks (0-62 weeks)	34.4 kg	37.5 kg
Feed/100 Hatching Eggs (0-62 weeks)	28.3 kg	31.1 kg

Broiler: As Hatched

	Ross PM3		Ross 308	
Age	Body weight	FCR	Body weight	FCR
7 days	185	0.892	185	0.893
14 days	474	1.133	473	1.136
21 days	917	1.287	916	1.291
28 days	1480	1.432	1479	1.434
35 days	2109	1.578	2113	1.576
42 days	2755	1.726	2768	1.719
49 days	3378	1.876	3407	1.861
56 days	3950	2.028	4002	2.004
63 days	4451	2.181	4531	2.147
Processing at 2.4kg				
Eviscerated Yield %	72.3		72.4	
Breast Meat Yield %	21.6		21.8	

Notes

Aviagen®

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.

For further information on the management of Ross stock, please contact your local Technical Service Manager or the Technical Department.

Newbridge
Midlothian, EH28 8SZ
Scotland, UK

t. +44 (0) 131 333 1056
f. +44 (0) 131 333 3296
infoworldwide@aviagen.com

Cummings Research Park
5015 Bradford Drive
Huntsville, Alabama 35805, USA

t. +1 256 890 3800
f. +1 256 890 3919
info@aviagen.com

www.aviagen.com