CHARACTERIZATION OF GROWTH AND EGG PRODUCTION OF TWO PORTUGUESE AUTOCHTHONOUS CHICKEN BREEDS: PRETA LUSITÂNICA AND AMARELA

M. L. Soares[1], J. C. Lopes[1], N. V. Brito[1], J. Carvalheira[2,3]

[1]IPVC- Escola Superior Agrária de Ponte de Lima, Refóios, 4990-706, Portugal; [2]ICETA/CIBIO, University of Porto, Rua P. Armando Quintas, Crasto, 4485-661 Vairão, Portugal; [3]ICBAS, University of Porto, Largo Prof. Abel Salazar 2, 4099-003 Porto, Portugal

INTRODUCTION

The aim of this study was to analyze female growth and egg production of two Portuguese indigenous chicken breeds, Preta Lusitânica (PL) and Amarela (Am). These breeds are classified as endangered with less than 2000 females per breed. The growth period was from birth to the end of the first laying period and included 2 lots per breed: PL1 (Am1) born in September (November) of 2008 and PL2 (Am2) born in March (April) of 2009.

MATERIAL AND METHODS

The birds were fed a commercial starter diet from 0 to 20 days and then were allowed to graze freely with a daily supplement of corn in a free range production system. Body weights (**BW**) were recorded every 15 days. Number of females for PL1 (PL2) were 8 (21) at the beginning of the study and ended with 8 (17); for Am1 (Am2) they were 13 (29) at the beginning and 10 (24) at the end. All eggs were weighted and measured, totalizing 527, 1524, 901 and 2412 eggs for PL1, Am1, PL2 and Am2, respectively. Table 1 contains the descriptive statistics for all parameters studied for each breed and lot.

Statistical analysis - The Gompertz function was chosen as the most appropriate equation for the characterization of the growth curve as described by Mignon-Grasteau and Beaumont, 2000; Goliomiytis, M. *et al.* 2003; Freitas, 2005:

$$M = A.e^{-e-B.(t-C)}$$

Where: **M** = body weight (g), **t** = age (days), **A** = mature weight (g), **B** = relative growth at the inflection point (g/day), **C** = age at inflection point (days), **e** = the base of the natural logarithm.
Growth rate was estimated by the first derivative of the Gompertz function.

RESULTS AND DISCUSSION

Results are in Table 1. The difference in adult BW and production of eggs permits to distinguish the two breeds in terms of type of production. More heavy and with a smaller egg production, PL breed shows a greater attitude for broiler as opposed to the Am breed that may be considered as a layer in this production system (Figures 1 to 4). This may also be inferred by the maximal growth rate estimated (Table 1) where the PL breed daily gain was on average 13% greater than the Am chickens. Monthly laying percentage of the Am Breed peaked at 70 % compared with only 40% for the PL (Figures 3 and 4). The eggs in both breeds and both lots were classified as medium size, according to the European classification (average between 53 and 63 g).

Differences between lots within breed are related with the month of birth. PL1 and AM1 which began laying in March and April had better results than those initiated in January (shorter days length).

Table 1- Descriptive statistics for the main parameters studied for the Am and PL chicken breeds

	PL1	Am1	PL2	Am2
Date of births	29/09/2008	14/11/2008	30/06/2009	29/07/2009
Adult body weight estimated (g)	2642±45.5	2027±43.6	2433±17.6	1902±12.7
Maximal growth rate (g/day)	20.3	14.9	17.9	18.2
Age of maximal growth rate (days)	65	62	78	71
Start laying	01/03/2009	12/04/2009	16/01/2010	03/01/2010
Age of start laying (days)	152	149	199	154
Total eggs/hen/year	65	120	40	99
Body weight estimated-start laying (g)	2247	1703	2226	1696
Average egg weight (g) of flock	53.52±6.32	54.82±7.38	56.92±4.67	54.82±5.06
Average egg length (cm) of flock	5.52±0.41	5.55±0.42	5.70±0.29	5.47±0.27
Average egg width (cm) of flock	4.14±0.16	4.20±0.22	4.22±0.16	4.23±0.20

CONCLUSION

The present study is part of a larger project aiming the preservation of the Portuguese chicken breeds that are near extinction. Further studies include a more complete genetic characterization of these breeds, evaluation of meat and egg quality, QTL identification, among others.
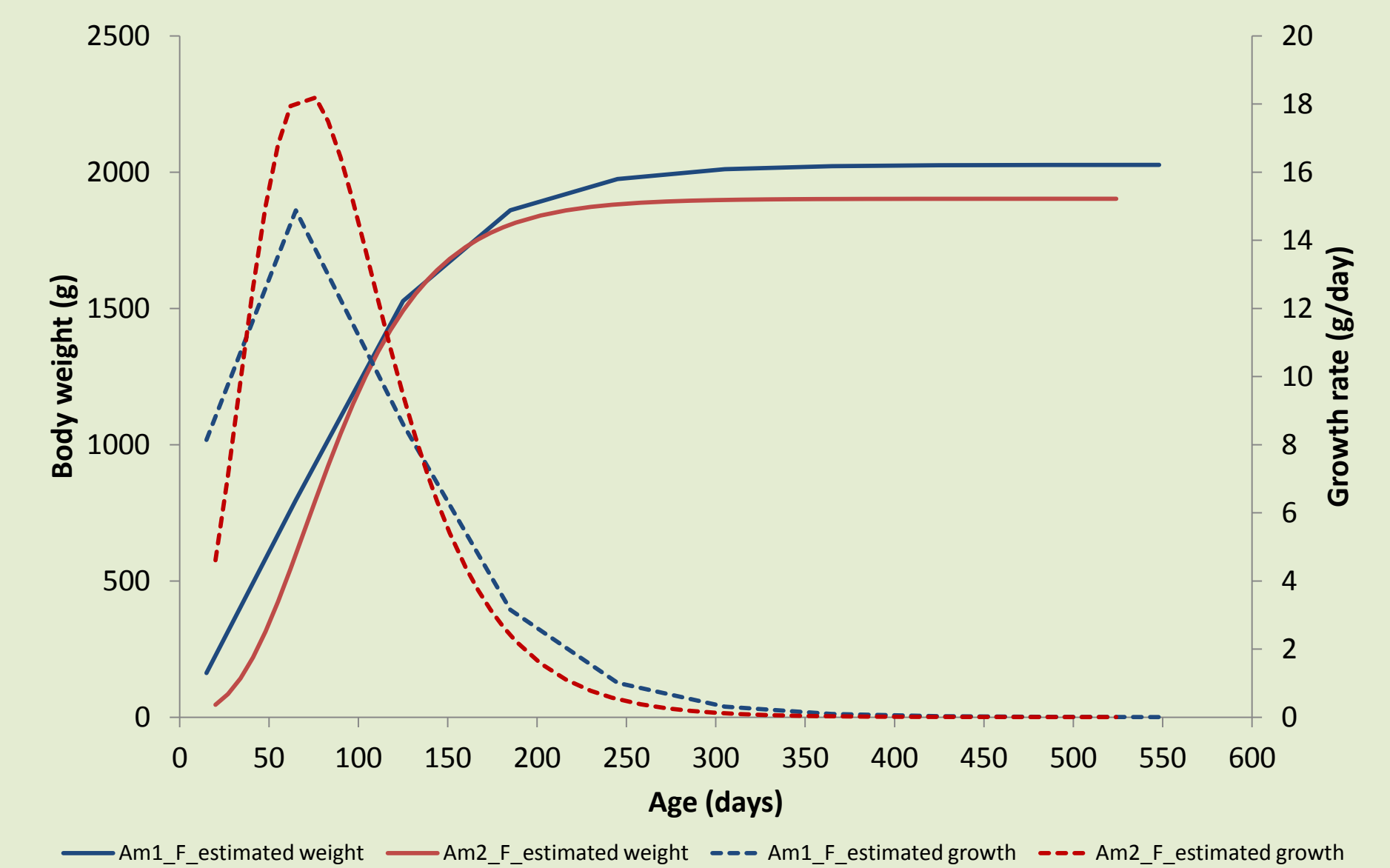

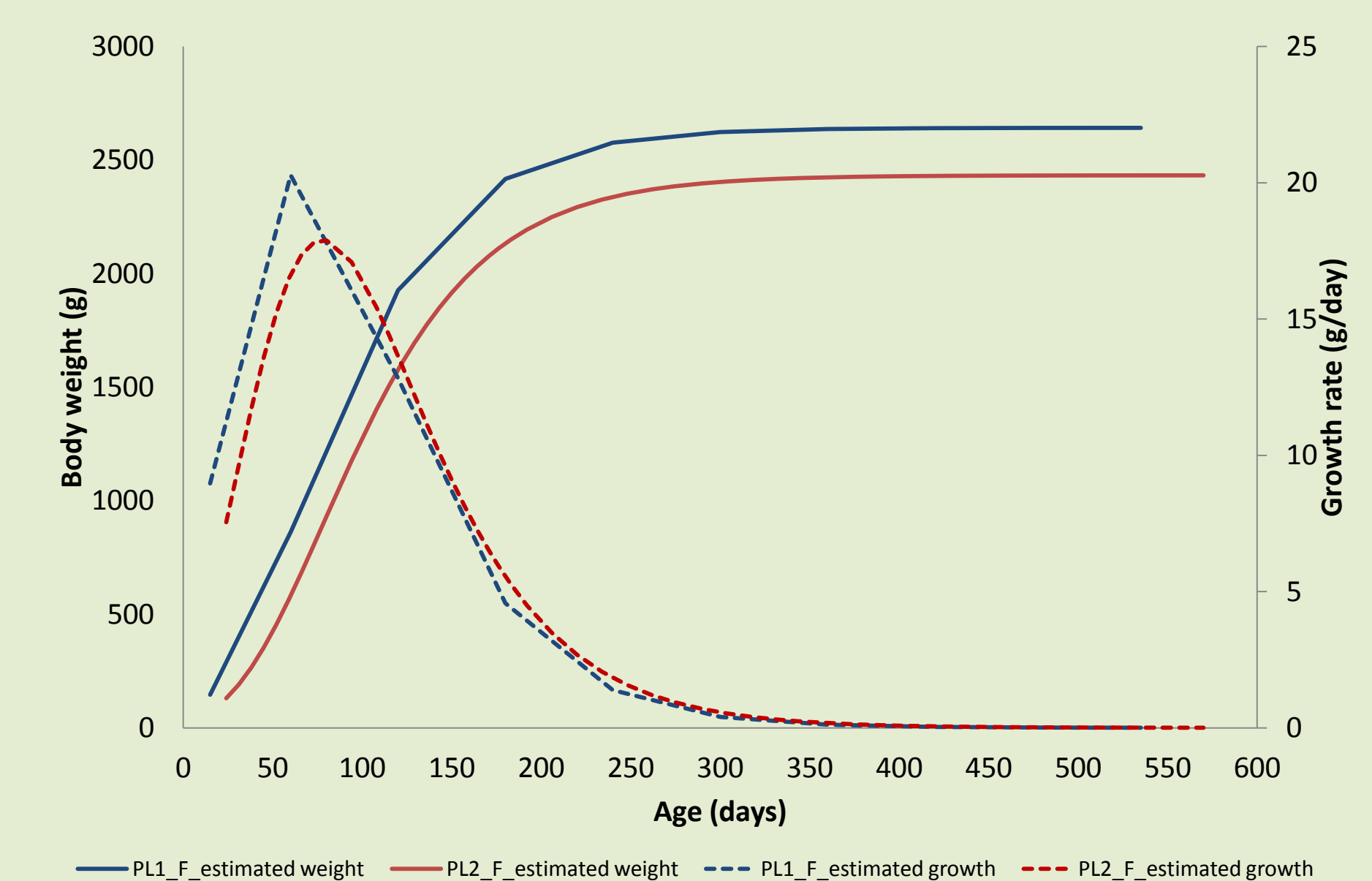**Figure 1** – Growth curve and growth rate for Am1 and Am2

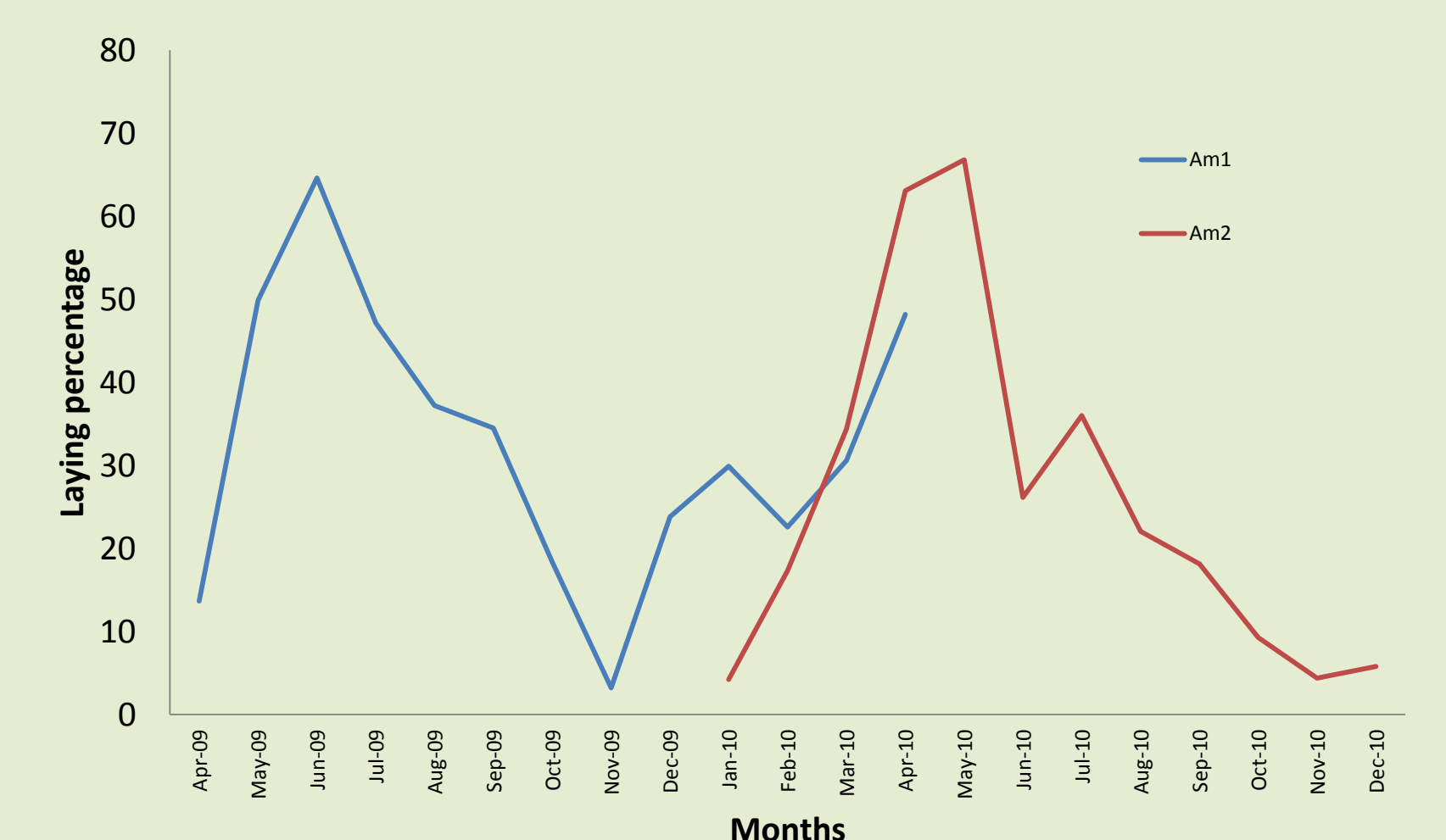
Figure 2 – Growth curve and growth rate for PL1 and PL2

Figure 3 - Monthly laying percentage Am1 and Am2
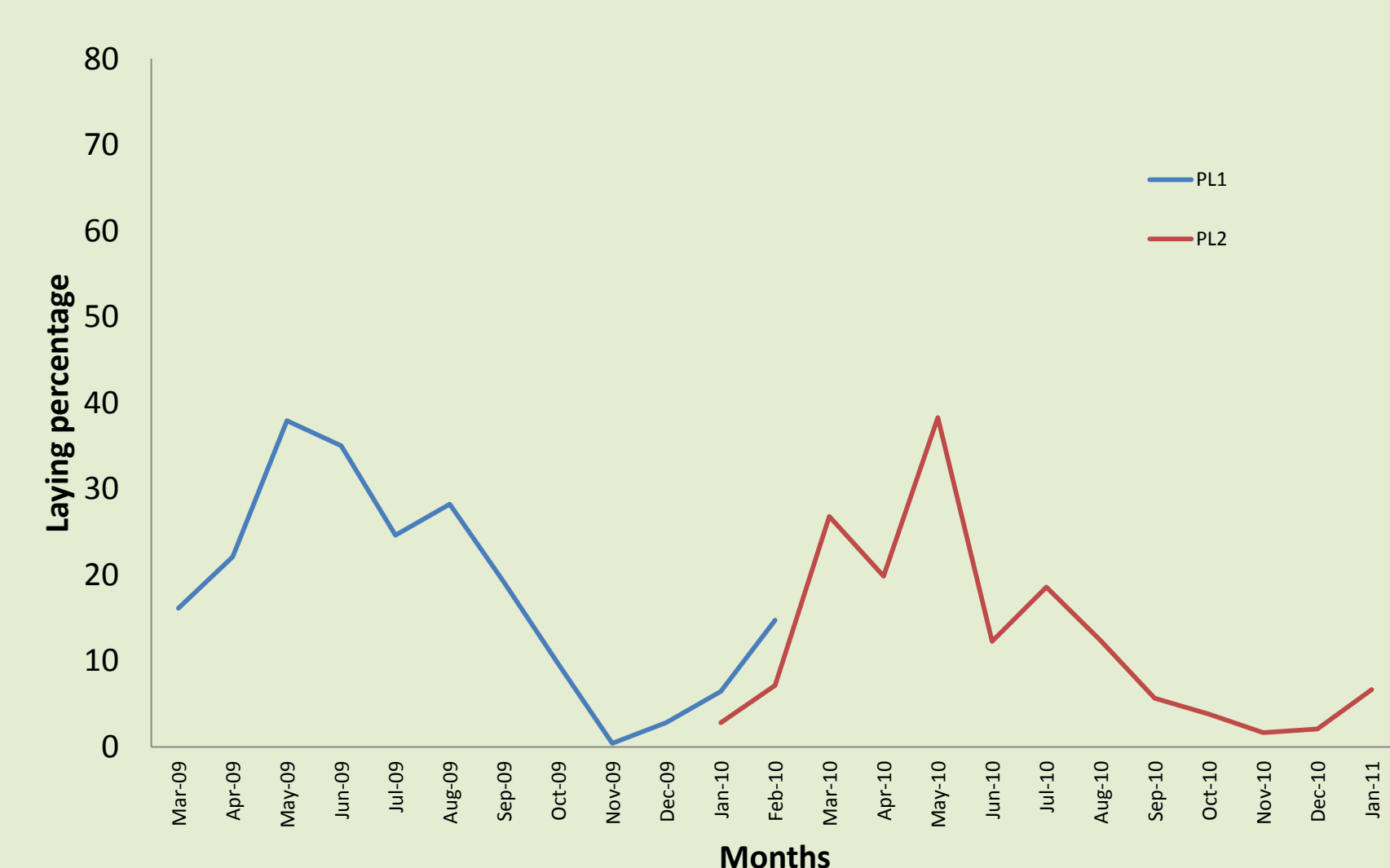

Figure 4 - Monthly laying percentage PL1 and PL2

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