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## EGG LAYING UNDER ARTIFICIAL PHOTO-REGULATION IN THE RED PARTRIDGE

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## SUMMARY

26 red partridge pairs, raised in outdoor cages, were exposed to artificial prolongation (16L:8D) of the natural photoperiod, Jan thr. May and Jul thr. Oct., while, during May-Jun, they were moved inside a dark room and exposed to short day-length (6L:18D). 77% of partridges laid during the 1<sup>st</sup> laying period 25.2 egg/pair with 82% fertility and 92% hatchability. 95% of 1<sup>st</sup> laying birds laid during an additional laying period 24.5 egg/pair with 75% fertility and 86% hatchability.

## INTRODUCTION

Partridge breeders are used to selecting birds for egg production, and cross different partridge varieties (ex: *A. graeca chukar* x *A. rufa*) to increase the productivity of their farms. These techniques, considering that number of egg produced is negatively related to bird brooding attitude and that natural partridge genotype is modified, are very dangerous for future wild-bird survival. Since, alternatively, profits of the game-bird farms can be increased by anticipating the laying period of some of the pairs (4) and/or by inducing the partridges to lay twice or more a year (5), we studied the possibility of recycling one-year-old red-partridges (*A. rufa*) utilising the simple technology already tested in a previous preliminary trial on two-year-olds (1).

## MATERIALS AND METHODS

For the trial, 52 red partridges (26 males and 26 females) 250 days old, were used. The birds, drawn from the same group, were force paired and housed in outdoor wooden cages with metallic net floors. They were fed ad libitum (3) with two differently formulated diets: Layerfeed (long day time) and Rearingfeed (short day time) and subjected to the day light program shown in figure 1. Long days were obtained by prolongation of natural lighting. Short days were obtained exclusively by artificial light (for this purpose, during the short day time, the pairs were moved inside a completely darkened - <1lux - poultry house). Every day R.U. and max and min temp., and number and weight of layed eggs were recorded. The collected eggs were stocked for a maximum of six days and, on weekly incubations, hatch percentages and reason for non-hatch were noted. Live weights were monitored at the beginning of the trial, at daylight variation and at plasma-drawing which was carried out, in addition to during short day time, in the early and last part of the two breeding periods.

Plasma LH was determined by R.I.A. method (2) on freeze-dried samples.

RESULTS AND DISCUSSION

During the 1<sup>st</sup> breeding period 4 birds died as a consequence of aggression due to forced pairing and 2 pairs didn't produce any eggs. In the 2<sup>nd</sup> long day period, only 1 of the remaining pairs didn't lay. The performances in the 2 breeding periods - Table 1 - were comparable but a high significant difference was observed between avg. number of days following long days and avg. egg weight which, obviously, was higher in 2<sup>nd</sup> laying bird. Plasma LH levels, fig 1, fell progressively during each egg-laying cycle and a further step decrease was associated with short daylight.

Table 1. Partridge performance.

BREEDING PERIODS:	
Hens laying.....n	20 19
Days to 1 <sup>st</sup> egg foll.long day."	44.1 25.2
Days of each laying period...."	51.7 42.0
Egg/bird....."	25.2 24.5
Egg weight.....g	16.5 17.5
Incubated eggs.....%	91.2 93.5
Fertility (on incub.eggs)....."	81.6 74.4
Hatchability (on fertil.eggs)....."	91.6 85.4

CONCLUSION

Our results indicate that 7 weeks of short day is sufficient time for termination of absolute fotorefractoriness in *A. rufa*, as evidenced by the increased serum LH concentration following photostimulation and because nearly all the birds (95%) laid during the 2<sup>nd</sup> production-period. It is necessary to transfer the pairs inside a darkened building during short day period whereas during long days the cages may be left outside.

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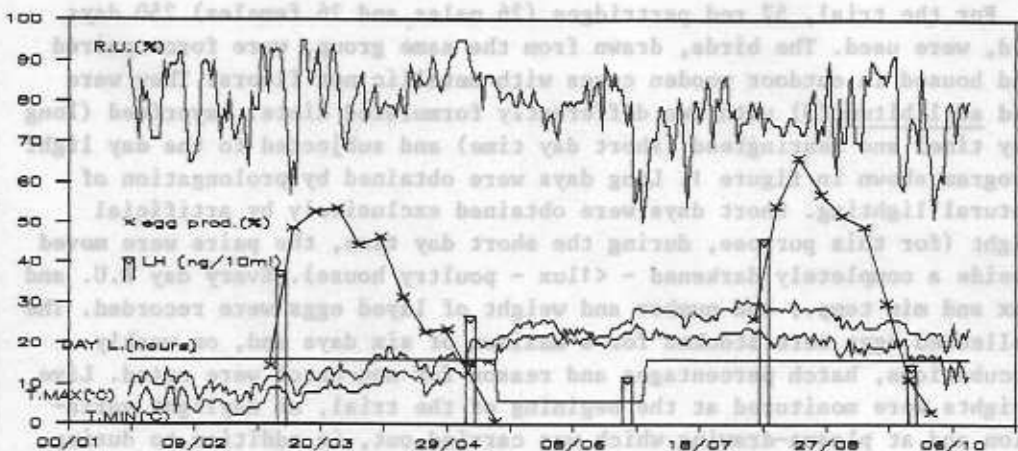


Fig. 1. Egg production, LH plasma levels and environment.

We are grateful to Prof B.K. Follet for carrying out the LH assays.

## LA DEPOSICION DE HUEVOS BAJO FOTO-REGULACION ARTIFICIAL EN LA PERDIZ ROJA

Fue efectuada una investigación con la intención de estudiar la posibilidad de enducir en la perdiz roja la deposición de huevos dos veces al año solamente modificando el foto-periodo. A tal fin 26 parejas de perdices rojas criadas en jaulas al aire libre fueron sometidas a prolongación artificial del foto-periodo natural (16L:8D) de Enero a Mayo y de Julio a Octubre, mientras que de Mayo a Junio fueron colocadas en un cobertizo oscuro con breves periodos de luz natural (6L:18D). Durante el primer periodo de deposición, el número, la fertilidad y la eclosión de los huevos, fué respectivamente en promedio: 25,2 huevos/pareja, 82% y 92% y, durante el periodo adicional de producción, fué de 24,5 huevos/pareja con 75% de fertilidad y 86% de eclosión.

## LEGEVERLAUF UND KÜNSTLICHES BELEUCHTUNGSPROGRAMM IN DEM ALECTORIS RUFUS

Es sind Forschungen gemacht worden über die Möglichkeit, dass das Rothuhn zweimal im Jahr Eier legen kann dank des nur künstlichen Beleuchtungsprogramms. 26 Paar Rothühner im Käfig im Auslauf gehalten wurden von Januar bis Mai und von Juli bis Oktober dem künstlich verlängerten natürlichen Beleuchtungsprogramm ausgesetzt. Von Mai bis Juni wurden die Rothühner in einem dunklen Raum gehalten und einem kurzen Tageslicht ausgesetzt. Das Ergebnis war: während der besten Legeperiode 25,2 Eier pro Paar, 82% Befruchtung und 92% Schlupffähigkeit; in der zweiten Legeperiode war die Zahl der Eier pro Paar 24,5 die Befruchtung 75% die Schlupffähigkeit 86%.

## LA DEPOSITION DE LA PERDIX ROUGE EXPOSEE A UNE PHOTOPERIODE ARTIFICIELLE

On a exposé 26 couples de perdix rouge, élevées en cage en plein air, à une prolongation artificielle de la photoperiode naturelle de Janvier jusqu'à Mai et de Juillet jusqu'à October (16L:8D); au contraire on a mis les couples pendant Mai-Juin dans une chambre obscure et elles ont été exposées à une photoperiode courte (6L:18D). 20 perdix ont déposé pendant la première periode de deposition 25,2 oeuf/couple avec 1'82% de fertilité et le 92% d'éclosion. 19 oiseaux ont déposé pendant la deuxième periode de deposition 24,5 oeufs/couple avec le 75% de fertilité et le 86% de éclosion.

## ИСКУССТВЕННЫЙ ФОТОПЕРИОД И КЛАДА ЯИЦ КРАСНЫХ КУРОПАТОК

26 пар красных куропаток, разведенных в клетках на воздухе, были поставлены на фотопериод искусственно удлинен (16 часов света: 8 часов темноты, 16L: 8D), с января до мая и с июля до октябрь, но в июне они перемещены в темную камеру и поставлены на период короткого света (6L:18D). Число, вес, процент вылупливания из яйца, живой вес были контролированы. Разницы не было в числе яиц, в плодородии и в проценте вылупливания между куропатками опыта и разведением сравнения. В течение первого периода кладки яиц (25,2 яйца по паре, 82% и 92%, соответственно). Во всяком случае 95% куропаток опыта клало, во время второй кладки 24,5 яйца по паре с 75% плодородия и с 86% процента вылупливания.

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