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Hormonal stimulation of ovarian development, ovulation and oviposition in Japanese quail

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Abstract

Stimulation of ovarian development and ovulation leading to production of fertile offspring using exogenous hormones has been successful in mammals, but until recently this was not the case for avian species. These techniques would be useful for increasing the reproductive output of endangered birds such as the kakapo.

Pregnant mare serum gonadotropin (PMSG) was used to stimulate ovarian development in Japanese quail as it is readily available, easy to use, and equally effective as avian gonadotropins. The research examined the best method for administering PMSG, and the doses, duration and frequency of treatment required to stimulate follicular growth.

Treatment with PMSG can stimulate ovarian development, ovulation and oviposition in Japanese quail held under a short day photoperiod. However, there was considerable variation in ovarian response to PMSG between birds receiving the same treatment. In birds in which large yellow follicles developed, many follicles were similar in size and were not arranged in a hierarchy.

Doses of 20-80 IU PMSG were the most appropriate for stimulating ovarian development in Japanese quail. Doses lower than 20 IU PMSG stimulated little or no ovarian development in most birds, and doses higher than 80 IU PMSG led to overstimulation of follicular development in most birds. Continuous delivery of PMSG by osmotic pumps and daily treatment using injections were equally effective in stimulating ovarian development in Japanese quail. The use of daily injections is a more practical method of delivering PMSG to birds, as it does not involve surgery and allows more control over dosage and timing of treatment. Treating birds with injections of PMSG every two days rather than daily led to a rate of ovarian growth similar to that of long day birds. Treatment every four days was not sufficient to stimulate ovarian development in quail. Restricting the feed intake of quail did not have any effect on the ovarian response to PMSG treatment.

Although PMSG can stimulate ovarian development and ovulation in Japanese quail, further work is required to increase the number of birds that respond to treatment, increase the number of eggs produced by an individual, and improve egg quality.

Statement

This is to certify that the work on which this thesis is based was carried out by the undersigned, and has not been accepted in whole or in part for any other degree or diploma. Assistance is specifically recorded in Acknowledgements section and within each chapter.

A section of the work presented in Chapter 3 has in published as follows:

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A handwritten signature in black ink, reading "E Bennett". The signature is written in a cursive style with a large initial "E" and a long, sweeping underline.

Ellen Joan Bennett

(2002)

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