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Incidence of Parthenogenetic Development in Eggs Laid by Three Strains of Dark Cornish Chickens. (23779)

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Cells of parthenogenetic origin were observed microscopically in the blastodiscs of newly laid infertile avian eggs by Oellacher (1); Duval(2); Lacaillon(3); Bartelmez and Riddle(4), as well as by others. This literature has been reviewed by Olsen and Marsden (5). More recently, Kosin(6) reported finding nucleated cells in 15% of the germinal discs of infertile, newly-laid White Leghorn and Barred Plymouth Rock eggs. Olsen and Marsden(7) examined macroscopically the germinal discs of infertile chicken eggs following a 7-9 day period of incubation. A limited development of the germinal disc was observed in 13.5% of Dark Cornish eggs and 1.5% of the Silver Cornish eggs. No parthenogenetic development could be detected by this method in infertile eggs laid by Rhode Island Red and New Hampshire hens.

Materials and methods. Infertile eggs from 3 strains of Dark Cornish chickens were examined both microscopically and macroscopically to determine the relative incidence of parthenogenetic development. Sixty-four virgin Dark Cornish pullets were used in the testing. 11 birds (Strain A) were F_1 progeny from matings of hens from a flock maintained at Agricultural Research Center with males from a commercial source. Strain B was composed of 12 birds from another commercial source and Strain C was composed of 41 birds from a third source. Whether the birds from the 3 commercial sources were related is not known but it is considered unlikely. The first 2 eggs laid by each of these hens were broken out when laid, and the blastodisc of each was fixed, sectioned, and stained with Heidenhain's Iron Hematoxylin. Each blastodisc was studied microscopically and if either egg from each hen showed parthenogenetic development, the bird was classified as a producer of parthenogenetic eggs. This technic was similar to that used by Kosin(6). All eggs subsequently laid through a 5-month period were incubated 9-10 days and then broken-out and any macroscopically observable parthenogenetic development recorded. This technic was similar to that described by Olsen and Marsden(5). The results obtained at both times of observation (Table I) were recorded on an egg and bird basis, *i.e.* the number of eggs which showed parthenogenetic development in the total number of eggs laid, and the number of hens which laid one or more eggs showing parthenogenetic development in the total number of hens tested.

Results. All 11 birds of Strain A produced eggs showing parthenogenetic development at

TABLE I. Incidence of Parthenogenesis in 3 Strains of Dark Cornish Chickens Expressed as Percent of Birds and Percent of Eggs Observed Microscopically at Laying and Macroscopically after Incubation.

	At laying			After incubation		
		Parthenogenetic			Parthenogenetic	
Strain	Total No. obs.	No.	%	Total No. obs.	No.	%
	Incidence on bird basis					
A	11	11	100	11	7	63.6
B	12	10	83	12	4	33.3
C	41	23	56	41	3	7.3
Total	64	44	69	64	14	21.9
	Incidence on egg basis					
A	22	22	100	510	20	3.90
B	24	16	66	754	5	.66
C	82	35	43	1314	5	.38
Total	128	73	57	2478	30	1.16

lay. 83% (10 of 12) of Strain B birds, and 56% (23 of 41) Strain C birds had parthenogenetic development in newly laid eggs. Likewise 63.6% (7 of 11) Strain A birds, 33.3% (4 of 12) Strain B birds, and 7.3% (3 of 41) of Strain C birds produced eggs showing parthenogenetic development as observed after 9-10 days incubation. On an egg basis the microscopically observed incidence of parthenogenesis (57%) establishes the Dark Cornish breed as the highest producer of eggs showing parthenogenetic development of all domestic breeds of chickens reported on to date.

These data indicate definite strain differences within the Dark Cornish breed with regard to incidence of parthenogenesis. While Olsen(8) suggests that heredity is not exclusively in control, there is strong indication here that genetic factors are significant. Genetic differences are quite evident at the breed level since the incidence in these stocks is four times that reported by Kosin(6) in 2 different breeds of chickens.

It is apparent from the method employed that Olsen and Marsden(5) did not count those eggs which may have had parthenogenetic cells in the blastodisc at laying but did not develop further when incubated. It would be interesting to know whether some of the eggs considered non-parthenogenetic by Olsen and Marsden would show parthenogenetic cells if examined at the time of lay.

Summary. Infertile eggs from 3 strains of virgin Dark Cornish pullets were examined either microscopically at laying or macroscopically after 9-10 days incubation to determine relative incidence of parthenogenetic development. The data indicate the incidence of parthenogenesis may vary not only in different breeds or strains of birds, but also the observed incidence may vary with different technics of observation and different times at which these observations are made.

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Some Sources of Error in the Akerfeldt Test for Serum Oxidative Activity.* (23780)

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The procedure recently introduced by Akerfeldt(1) for estimating serum oxidative activity is based on the rate at which color develops after equal parts of serum and of a 0.1% aqueous solution of N, N'-dimethyl-p-phenylenediamine (DPP • 2HCl) are mixed in the absence of added buffer. According to Akerfeldt, normal sera caused little color change in the first 3 to 5 minutes whereas sera from patients with psychoses (and with many other diseases, as well as normal pregnancy) caused rapid development of color. However, observations made in these laboratories demonstrated that Akerfeldt's method does not accurately measure oxidative activity and cannot be used as a test for psychosis.

Observations. 1) *Temperature*: We found that small variations in initial temperature of the reaction mixture, or merely absorption by the mixture of heat generated in the spectrophotometer, significantly altered the

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