Egg Weight as Related to Hatchability in Broad Breasted Bronze Turkeys

By

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A NUMBER of investigators have shown that egg size infl ences hatchability in the chicken. The literature on th subject has been reviewed by Landauer (1941). Some wor on the effect of size on the hatchability of turkey eggs has als been reported. Work reported by Marble and Margolf (1936 showed that turkey breeders laying either small or extremely larg eggs gave a lower percent hatch than those laying a medium siz egg. Results of investigations on the influence of individual eg weight on hatchability by Byerly and Marsden (1938) and Insk McLaury and Baute (1943) show that turkey eggs of medium siz hatch better than small or very large eggs.

The purpose of these investigations was to contribute furth information to the subject of turkey egg size as related to hatc ability and to determine if egg weight influences the hatchabili of eggs from Broad Breasted Bronze turkeys.

During 1945 and 1946 all normal eggs laid by the station turkey flocks were weighed in grams and set in a forced-draft type incubator at semi-monthly intervals through June 15. A total of 9003 eggs from 129 hens were weighed. All hens and toms in the flock were hatched the previous spring. Each year Pens 1 to 4 mated naturally with toms. Toms in Pens 1 and 2 were stationary, while those in Pens 3 and 4 were rotated or switched at weekly intervals. Pens 1 and 4 were kept in complete confinement, whereas those in 2 and 3 were housed in similar quarters but also had access to outside yards. Pens 5 and 6 were confined and artificially inseminated. All turkeys received similar mash and scratch grain. All pens were artificially lighted commencing January 3 each year. All pens were trapnested, and only eggs laid in trapnests were used in these studies.

The relation of individu turkey egg weight to hatchabil ty is shown in Table 1. Thes data are for eggs laid durin February and March for bo years. This particular perio was selected because it was period during which hatchabili remained relatively constant. other studies it was observe that hatchability declined du ing April, May, and June whil egg weight increased. Consider ing all pens for both seasons i is observed that eggs weighin up to 94 grams hatched bett than those heavier than th weight. When egg weight in creased above 94 grams hatch ability of fertile eggs decrease noticeably. Hatchability wa highest for eggs weighing fro 80 to 84 grams. Eggs weighin less than 80 grams hatche better than the very large egg and almost as well as the med ium weight eggs.

Although there is som tendency for the relationshi

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Table 1.—Relation of weight to the hatchability of fertile turkey eggs.

Item	Egg weight classes						
	74 grams and less	75-79 grams	80-84 grams	85-89 grams	90-94 grams	95-99 grams	100 grams and over
Experiments in 1945							
1							
rtile eggs, number	7	34	75	87	52	25	9
tchability, percent	85.7	91.2	88.0	82.8	78.8	72.0	44.4
2							
rtile eggs, number	2	18	34	25	37	33	12
tchability, percent	100	94.4	85.3	72.0	78.4	87.9	66.7
3							
rtile eggs, number	2	5	35	72	51	22	1
tchability, percent	100	100	94.3	86.1	92.2	81.8	100
4							
rtile eggs, number	8	22	41	75	40	16	7
tchability, percent	75.0	90.9	97.6	86.7	85.0	81.3	100
5							
rtile eggs, number	1	14	38	56	22	6	0
tchability, percent	0	71.4	81.6	83.9	90.9	100	0
6							
rtile eggs, number	44	36	68	33	26	1	0
tchability, percent	77.3	58.3	72.1	69.7	65.4	100	0
6 Pens							
rtile eggs, number	64	129	291	348	228	103	29
tchability, percent	78.1	80.6	85.2	82.5	82.5	82.5	69.0
Experiments in 1946							
1							
rtile eggs, number	13	38	96	111	69	21	8
tchability, percent	84.6	68.4	76.0	75.7	78.3	61.9	37.5
2							
rtile eggs, number	8	51	125	69	23	4	1
tchability, percent	75.0	84.3	80.0	85.5	95.7	100	100
3							
rtile eggs, number	6	31	107	100	77	21	10
tchability, percent	66.7	93.5	92.5	89.0	81.8	71.4	60.0
4							
rtile eggs, number	5	39	129	117	49	19	2
tchability, percent	100	89.7	88.4	88.0	87.8	73.7	50.0
5							
rtile eggs, number	20	80	172	122	64	20	2
tchability, percent	80.0	75.0	72.7	66.4	76.6	50.0	100
1-5 pens							
rtile eggs, number	52	239	629	519	282	85	23
tchability, percent	80.8	80.8	81.2	80.2	81.9	65.9	56.5
Sum of 1945 and 1946 Experiments							
rtile eggs, number	116	368	920	867	510	188	52
tchability, percent	79.3	80.7	82.5	81.1	82.2	75.0	63.5

etween egg weight and hatchbility to be curvilinear it is less o than that in the data reported y Insko and co-workers and Byerly and Marsden. In these xperiments the hatchability of mall eggs was only slightly less han that of the medium size ggs whereas both the above groups of workers found that the hatchability of the smallest eggs was appreciably below that of the medium size eggs. Observations on all three flocks, however, definitely show that the hatchability of the very large eggs was lower than that of medium weight eggs.

Table 2.—Average egg weight of turkey hens as related to hatchability of fertile eggs.

Average egg weight class	Hens	Average hatchability of fertile eggs
grams	number	percent
less than 75	1	64.6
75 - 79.9	5	81.7
80 - 84.9	26	82.5
85 - 89.9	40	77.2
90 - 94.9	24	77.8
95 - 99.9	7	65.9

Table 2 shows the relation of turkey hens' average egg weights to hatchability. These average egg weights are for all eggs laid during the season to June 15. Eggs from hens with average egg weights of less than 95 grams hatched much better than eggs from hens with average egg weights of 95 grams or over. Hatchability was some higher with hens in the 75 to 84.9 gram egg-weight class than with hens in the 85 to 94.9 gram egg-weight class.

Since there were no hens with average egg weights of 100 grams or more, the individual eggs weighing over 100 grams (Table 1) were all laid by hens whose average egg weights fell in the lower classifications. The fact that these eggs showed the lowest hatchability indicates that very large eggs (100 grams or over), which are heavier than the average egg weights of the hens producing them, do not hatch as well as lighter eggs laid by these hens.

Summary

Results of investigations over a two year period with eggs from 129 Broad Breasted Bronze turkey hens show that eggs weighing less than 95 grams hatched better than those weighing 95 grams or over. With eggs weighing from 75 to 94 grams the hatchability of fertile eggs was over 80 percent. The highest hatchability, 82.5 percent, was obtained with eggs weighing from 80 to 84 grams.

Eggs from hens with average egg weights of less than 95 grams hatched better than eggs from hens with heavier average egg weights. Hatchability was best with eggs from hens with average egg weights of 75 to 85 grams.

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