WEIGHT VARIATIONS IN BIRDS AT A FEEDER

By Robert P. Yunick

A number of reasons led me to begin weighing birds as a matter of routine at my home feeder in early April, 1964. Among them was the fact that many identification texts and general texts on birds go to great detail to describe plumages, plumage changes, measurements, etc., and how these are related to adults, immatures, males, and females, however, very few texts give much consideration to the weights or weight changes of these very same birds. Secondly, as long as I have been familiar with the evening grosbeak, its ways have intrigued me. Particularly I have been impressed with its feeding habits. The fact that at certain times of the day the birds flock to traps baited with sunflower seeds and at other times appear totally indifferent to the seeds, and are content to remain in the treetops calling and preening has mystified me. It seemed that it would be of interest to investigate weight changes during their heavy feeding periods. It was of interest also to learn the weight loss of various birds during the night and how these compared at various seasons. Lastly, we hear much these days about banding projects and this seemed to fit into that category.

A triple-beam balance made by Ohaus, model no. 1750S ($20.50), was purchased. This balance has a capacity of 610g., about 1.3 lbs., and has an attachment weight kit ($5.50) which increases the capacity of the balance to 2610g., about 5.7 lbs. The balance has divisions to the tenth of a gram and the hundreth of a gram can be estimated. The birds were held securely wrapped in a polyethylene bag during weighing and the weight of the bag subtracted from the gross weight to get the birds' weights. The weights were taken to the hundreth of a gram and recorded to the nearest five minutes of the hour. The weights mentioned here were recorded between April 5, 1964, and May 15, 1964. Up to April 26, 1964, the times are Eastern Standard Time, and on April 26 and thereafter, the times are Eastern Daylight Time. During the period mentioned, 493 weights of birds of 31 species were recorded. This total includes repeats. Not all the birds that were captured were weighed, because time did not always allow measuring, weighing, ageing, sexing and banding of all the birds caught some mornings before work. Whenever possible, however, birds were weighed. In the future, added emphasis will be placed on the weighing.

Some of the results presented here are preliminary and need further substantiation. However, they are indicative of a weight relationship with which I was not familiar prior to collecting these data. In order to substantiate these data, more birds have to be weighed, so that representative averages can be obtained. I offer this preliminary information with the hope that other banders who have the time and opportunity will become interested in what is happening at their feeders and start weighing birds.

Due to the transitory nature of our feeder clientele during April and May, a number of the birds which were banded and weighed were not recaptured. At present their weight data can be used only for calculating averages. Those birds which did repeat and were reweighed offered some direct comparisons. These are given in Table I. The species abbreviations used in the Table are given after the name of each species in the discussion which follows.

EVENING GROSBEAK (EG) - 88 weights of 54 males and 29 females were recorded. One bird, 64-153119, was captured three times the same day and showed an approximately six percent weight increase from 6:20 a.m. to 3 p.m. Another bird - 64-198365, recaptured at nearly the same time of day as at its original capture, only four days later, showed a four percent weight change indicating that these birds' weights are not necessarily constant at the same time of day from day to day. The most pronounced weight difference was found in a female, 64-153096, whose weight increased over 11 percent between 6 a.m. and 10:45 a.m. on two separate days, four days apart. The last bird, 64-140139, underwent a very small weight change between 9:40 a.m. and 1:35 p.m. of the same day.

Since the evening grosbeak was one of the species that was handled most frequently, thus affording a fair sampling of weights, the data for all the birds were analyzed. The weights on the males were collected between 5:45 a.m. and 3:30 p.m. from April 5 to April 30. The average of the 58 male weights was 61.25g. (48.20-71.50g. range), while at the same time the average of the 30 female weights was 58.87g. (46.62-67.20g. range). The weights were segregated according to sex and hour of capture, and averaged for each hour. When these averages were plotted against the hour of capture, the curve for the males like that for the females began at an early morning minimum, reached a maximum between 7 and 9 a.m. and then decreased between 10 and 11 a.m. to a minimum almost equivalent to the pre-7 a.m. minimum, and then sharply rose through noon and the early afternoon. My first impression was one of great suspicion. Some points on the curve were substantiated by 15-20 or more weighings, but other points were the average of only three to five weighings and could be misleading. However, when the weight data for three other of the more commonly captured species were treated similarly, each one displayed a mid-morning minimum. The slate-colored junco showed a minimum between 10 and 11 a.m., the pine siskin at 8 to 9, and the American goldfinch at 9 to 10. Again the data on these species suffer from the same inadequacy as the grosbeak data, namely that some points on the weight vs. time curve are the average of sometime too few weights. It is significant, however, that each of these species displayed this minimum. Hopefully during the winter of 1964-1965 enough data will be collected to conclusively show whether this minimum is real, and if so, to what extent.

At present, if all the data for the males and females are combined, the average pre-7 a.m. weight is 58.7g vs. an average weight of about 65.7g at 3-4 p.m. It would appear that on the average, the weight increase

TABLE I

DATA ON REPEAT CAPTURES

SPECIES	BAND NO.	AGE/SEX	ORIGINAL CAPTURE DATE	TIME	WT.	REPEAT CAPTURE DATE	TIME	WT.	ΔWT.	%CHANGE
EG	64-153119	Ad.M.	4/19/64	6:20am.	67.48	4/19/64	2;55pm.	71.50	+4.02	+5.96
	64-153119	"	"	"	"	"	3:30pm.	71.45	+3.97	+5.89
	64-198365	"	4/16/64	6:25am.	63.65	4/20/64	6:15am.	61.10	-2.55	-4.01
	64-153096	Ad.F.	4/12/64	10:45am.	59.16	4/16/64	6:00am.	53.13	+6.03	+11.3
	64-140139	Ad.M.	4/5/64	9:40am.	59.75	4/5/64	1:35pm.	59.40	-0.35	-0.59
RWB	632-89920	SAd.M.	5/5/64	7:10am.	64.40	5/8/64	6:30pm.	65.40	+1.00	+1.55
SS	67-90167	Ad.U.	4/11/64	6:55pm.	22.33	4/17/64	6:00am.	19.90	+2.43	+12.2
R	632-89903	Ad.F.	4/15/64	6:00am.	72.80	4/23/64	6:30pm.	79.90	+7.10	+9.76
	632-89912	"	4/26/64	3:00pm.	80.00	5/11/64	5:55am.	71.40	+8.60	+12.0
CG	713-28829	"	4/18/64	1:45pm.	117.70	5/12/64	6:00am.	104.70	+13.00	+12.4
	713-28840	"	4/25/64	6:10am.	102.05	5/12/64	"	97.95	-4.10	-4.02
	713-28854	"	5/4/64	6:20pm.	98.85	5/8/64	7:00pm.	95.90	-2.95	-2.99
	713-28847	"	4/29/64	5:30pm.	117.65	5/1/64	6:45am.	112.00	+5.65	+5.09
	713-28826	Ad.M.	4/18/64	6:45am.	132.85	4/19/64	6:20am.	132.65	-0.20	-0.15
MD	673-65615	Ad.U.	4/21/64	5:00pm.	153.67	4/24/64	5:00pm.	157.90	+4.23	+2.75
WTS	32-153783	"	4/26/64	6:00pm.	28.43	4/29/64	8:45pm.	31.73	+3.30	+11.6
BCC	105-97844	"	4/11/64	6:30am.	10.84	4/11/64	7:20am.	10.92	+0.08	+0.74
BJ	713-28817	"	5/1/64	"	92.50	5/15/64	5:45pm.	89.03	-3.47	-3.75
SCJ	108-28030	Ad.M.	4/25/64	6:15am.	23.81	4/30/64	7:00am.	24.30	+0.51	+2.10
AGF	108-28009	U.U.	4/19/64	12:45pm.	14.76	4/23/64	6:45am.	14.10	+0.66	+4.68
	108-28019	Ad.F.	4/22/64	6:05am.	14.61	4/23/64	6:15am.	14.38	-0.23	-1.57
	108-28016	U.U.	4/22/64	5:50am.	13.66	4/25/64	8:05am.	13.75	+0.09	+0.66
	"	"	"	"	"	4/26/64	7:30am.	13.54	-0.12	-0.88
	103-58780	SAd.F.	4/5/64	1:00pm.	14.10	4/19/64	10:10am.	13.90	+0.20	+1.44
	103-58786	"	4/19/64	8:15am.	13.20	4/24/64	6:00am.	13.05	+0.15	+1.15
PS	105-97823	U.U.	4/5/64	8:00am.	13.09	4/5/64	9:30am.	12.87	-0.24	-1.83
	105-97799	"	"	10:25am.	14.15	"	1:35pm.	14.37	+0.22	+1.55

See discussion for an explanation of species abbreviations.
Age: Ad.=Adult, SAd.=Sub-adult, M.=Male, F.=Female, U.=Unknown.
All weights and weight changes are in grams.
In determining weight changes, the morning weights were given precedent over the afternoon weights, early am. over later am., early pm. over later pm., and early date over later date.

during the day, or if one prefers, the weight loss during the night is about 7g. This corresponds to an average weight increase of 11.9 percent during the feeding hours. Further weighing will determine this more accurately.

RED-WINGED BLACKBIRD (RWB) - 33 weights of 19 adult males and 13 subadult males were made between April 10 and May 4, 1964. The adult males averaged 69.8g. (58.33-78.65g. range) while the sub-adults averaged 65.1 g. (57.8-73.0g. range). The lighter adult males were as light as the lighter sub-adult males. One repeat, 632-89920, showed a 1.55 percent weight increase between 7:10 a.m. of May 5 and 6:30 p.m. on May 8.

SONG SPARROW (SS) - five weights were collected on four birds during April 11 to 25. One significant repeat - 67-90167 - showed a weight change of 12.2 percent between 6 a.m. of April 17 and 6:55 p.m. of April 11.

ROBIN (R) - 23 weights on 15 females and six males during April 6 to May 11. Two repeats on females showed substantial a.m.-to-p.m. weight increases of 9.76 and 12.0 percent. The females averaged 85.4g. (69.35-90.4g. range) vs. 78.3g. (76.2-81.60g. range) for the males, but more weights are needed.

COMMON GRACKLE (CG) - 48 weights on 15 males and 28 females during April 5 to May 15. The males averaged 132.59g. (118.65-144.25g. range) with half of the weights made before 7 a.m. The females averaged 101.8g. (92.83-123.80g. range) with 20 of the weights made before 7 a.m. The weight range overlap of the two sexes is slight. Except for the two heaviest females, all the females fell out of the male range. The repeats indicate some similarity with the grosbeak data. Two birds, 840 and 854, showed weight differences of three-four percent for the same time of capture on different dates, whereas a third bird, 826, showed a negligible weight change under similar circumstances. The two other birds show a.m.-to-p.m. increases, with the one of 12.4 percent for 829 being the greatest observed for any bird taken during the period.

MOURNING DOVE (MD) - seven weights on six birds during April 5 to May 10. The one repeat, like some of the grackles and grosbeaks, showed a nearly three percent change in weight at 5 p.m. on April 21 and 24. The few birds that were caught fell into two weight classes of about 125-135g. and 150-160g. Whether this can be associated with an age or sex difference remains to be seen.

WHITE-THROATED SPARROW (WTS) - 26 weights on 15 adults (white throat and crown markings) and 10 birds not in adult plumage (dingy throat and crown) during April 18 to May 12. Since the white-throats are known to be partial to feeding at or near dusk, it is not unexpected that a bird, 32-153783, caught one day at 6 p.m. and three days later after dark at 8:45 p.m. showed an 11.6 percent weight increase. Those birds in adult plumage averaged 27.4g. (22.15-31.73g. range), while those not in the

white adult plumage averaged 26.5g. (23.84-31.02g. range). The very similar weight ranges suggest that perhaps if a larger sample of weights were available, the two averages would be the same. The average of eight birds (four adults and four not in white plumage) caught before 7 a.m. was 24.65g., while the average of 11 birds (seven adults and four not in white plumage) caught after 6 p.m. was 28.30 g. The average difference of 3.65g. corresponds to an average early-a.m.-to-late-p.m. weight increase of 14.8 percent.

BLACK-CAPPED CHICKADEE (BCC) - 11 weights on 10 birds during April 11 and 12. The one repeat, 105-97844, showed a weight increase of 0.74 percent during the 50-minute interval noted. The average weight of seven birds before 7 a.m. was 10.78g. (9.60-12.0g. range), while the average of all 11 was 10.93g. (9.60-12.05g. range). In the latter average was only one weight after 10 a.m.

BLUE JAY (BJ) - 13 weights on 12 birds during April 28 and May 15. The lone repeat, 713-28817, was the only bird in the Table to display a negative a.m.-to-p.m. weight change. The average of the 13 weights, eight of which were pre-7 a.m., was 91.30g. (81.55-97.10g. range).

SLATE-COLORED JUNCO (SCJ) - 46 weights of 45 birds of mixed age and sex. The weights were gathered between April 5 and May 12. The average weight was 21.40g. (18.25-25.25g. range) with 19 of the weights recorded prior to 7 a.m. The one repeat showed a weight increase of 2.10 percent between 6:15 a.m. and 7 a.m. of two separate days five days apart.

AMERICAN GOLDFINCH (AGF) - 84 weights of 79 birds of mixed age and sex during April 5 to May 5. The average was 13.82g. (10.4-17.53g. range). The weight range was much larger percentage-wise for this species than for any other during this period. The sub-adult females (23 weights) averaged 13.44g. and displayed the maximum weight range above. Eight adult males averaged 13.77g. (12.9-14.95g. range). The average of 34 pre-7 a.m. weights was 13.73g. (12.05-15.54g. range) compared to an average of nine post-5 p.m. weights of 14.9g. (13.78-16.45g. range) or a difference of 8.53 percent. The repeats showed that the changes from 5-6 a.m. to 7-8 p.m. ranged from -0.88 to +1.57 percent; a change from mid-morning to early afternoon was +1.44 percent; and a change from early morning to shortly after noon was +4.68 percent.

PINE SISKIN (PS) - 32 weights of 31 birds of mixed age and sex during April 5 to April 19. The average was 14.34g. (11.75-17.50g. range). This species, like the goldfinch, displayed a considerable weight range. The average of seven pre-7 a.m. weights was 13.77g. (12.10-15.93g. range), while the average of seven weights taken between noon and 2 p.m. was 14.71g. (13.73-16.20g. range). No birds were captured and weighed after 2 p.m. Some of the species that were weighed were not recaptured for reweighing, however, some observations were made.

WHITE-CROWNED SPARROW - eight weights of adult birds taken between May 11 and 13 at 5:30 to 7:30 p.m. averaged 32.95g. (29.02-39.45g. range).

BROWN CREEPER - five weights of birds of unknown age and sex. Weights recorded between April 18 and 26 at 12:45 to 6:15 p.m. averaged 9.23g. (8.45-10.10g. range).

BROWN-HEADED COWBIRD - four weights of three females and one male taken between April 23 and April 29 between 6:00 and 6:45 a.m. showed a female average of 39.98g. (39.70-41.05g. range) with the lone male at 56.80g. Possibly someone who is swamped with cowbirds can check to determine whether the average difference is really this large.

HOUSE SPARROW - 22 weights of 16 adult males and six adult females between April 19 and May 15 at all times of the day gave averages of 28.25g. (24.70-29.93g. range) and 28.85g. (26.00-30.10g. range), respectively.

Lastly, just as a point of interest, it gave me great pleasure and delight, despite all the other work involved in taking and recording the weights given, to watch a male ruby-throated hummingbird tip the beam at 3.45g. at 6:30 p.m. of May 8, 1964.

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