

THE EFFECT OF TRANSFER CRACKS ON CHICK QUALITY AND HATCHABILITY

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SUMMARY. Transfer cracks were evaluated to determine the effect on hatchability and chick quality. 507 transfer cracked eggs were compared to normal eggs. Eggs with transfer cracks were graded as 3 - extensive cracks with or without pieces of shell missing, 2 - moderate cracks or 1 - minor, hairline cracks. Groups of grade 1, 2 and 3 cracked eggs were identified and hatched separately. Hatchability of normal eggs was 89%, culls were less than 0.5% and pips were less than 1.0%. Transfer cracks decreased hatchability by 15 - 48%. Transfer cracks increased the percent of cull chicks 7 - 19 times, and increased the percent of pips and chicks enclosed in dried down membranes 18 - 61 times.

Transfer cracks occur in the hatchery as eggs are moved from the incubators into the hatcher. Cracks can occur when the eggs are switched from the incubator egg flats into the hatching trays. The drop from the incubator egg holders onto the tray produces forces that can crack the eggs. The method of transfer at this point tends to play a role in the number of cracks. I have found that the use of suction type transfer machines tends to produce fewer cracks compared to manual, rotating transfer equipment and manually flipping the eggs onto the hatcher trays. Furthermore, the move away from metal trays to plastic trays in recent years has helped decrease the number of transfer cracks observed. Transfer cracks also occur when excessive force is used to insert the hatcher trays into the hatcher racks. The excessive force causes the eggs to slide to the back of the tray. When the full rack is rolled into the machine, excessive force will again cause eggs to slide to the back of the trays. As eggs hit the back of the tray and each other, transfer cracks can occur. As the force to insert trays into the rack and the racks into the hatcher increases, the severity of transfer cracks will also increase.

Most hatcheries monitor transfer cracks and employees are penalized in pay if the incidence is above a set percent. However, a high incidence of transfer cracks does not always cause concern. Lack of concern is based on the belief that small cracks, at a late stage of incubation, will not have a negative effect on the developing embryo. The following study was conducted to determine what effect transfer cracks have on hatchability and chick quality.

MATERIALS AND METHODS

Eggs were transferred from plastic incubator egg flats onto metal hatcher trays at 18 days of incubation. The transfer was conducted with a manual, rotating transfer machine. Three incubator egg flats were transferred at a time into one hatcher tray. Hatcher trays were placed onto hatcher racks and placed into the hatcher. After transfer, each tray was carefully removed from the rack and all eggs were examined for transfer cracks. The

positioning of the eggs on the tray was also noted. Transfer cracks were graded as follows: Grade 1 - minor, hairline cracks with no shell missing from the egg, Grade 2 - moderate sized cracks or multiple hairline cracks with no shell missing from the egg, Grade 3 - extensive cracks with noticeable space between the edges of the crack with or without shell missing from the egg. The three different grades of eggs were placed in separate trays and placed back into the incubators with the other eggs.

The trays containing the graded transfer cracked eggs were removed from the rack as the hatcher was emptied for chick processing. These trays were examined to determine hatchability and chick quality. The numbers of healthy chicks, cull chicks, pipped eggs and chicks enclosed in dried down membranes were recorded for each group of graded transfer cracks. Twenty random trays from the rest of the hatch were examined, after chick processing, to serve as a control.

RESULTS

A total of 507 transfer cracked eggs were identified and hatched. There were 157 Grade 1 eggs, 161 Grade 2 eggs and 189 Grade 3 eggs. The vast majority of cracked eggs were found at the back of the hatcher trays. The results from the hatch of each grade of transfer cracked eggs and the controls are shown in Table 1. The results for hatch, cull chicks, pips and dried down membranes for the transfer cracked eggs are shown as percents of the total number of cracked eggs collected for that group. The control results for hatch and cull chicks are shown as percents based on the total number of eggs set for the day's hatch. The total number of eggs set was just over 312,000 for this hatch. The control results for pips and dried down membranes are percents based on the total number of eggs in the 20 hatcher trays examined.

DISCUSSION

All grades of transfer cracks had a negative effect on hatchability and chick quality. Hatchability for each grade of transfer cracked eggs was decreased compared to the control hatchability. With each group of transfer cracked eggs the percents of cull chicks, pipped eggs and chicks enclosed in dried down membranes were increased compared to the control eggs.

Table 1. Results from the hatch of transfer cracked and control eggs.

Grade of Transfer Crack	Total No. of Cracked Eggs	Percent Hatch	Percent Cull Chicks	Percent Pips	Percent Dried Down Membranes
1	157	75.2	3.8	5.7	8.2
2	161	76.4	3.1	6.2	6.8
3	189	46.6	8.5	0	42.9
Control	NA	89	0.45	0.6	0.1