Effects on Turkey Poult's of Rations Containing Corn Invaded by *Fusarium tricinctum* (Cda.)

Sny. & Hans. ¹

C. M. CHRISTENSEN, R. A. MERONUCK, G. H. NELSON, AND J. C. BEHRENS

Institute of Agriculture and College of Veterinary Medicine, University of Minnesota,
St. Paul, Minnesota 55101

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Consumption of an otherwise balanced ration containing 1% of corn invaded by *Fusarium tricinctum* isolate 2061-C resulted in the death of 13% of turkey poult's within 35 days, in decreased feed efficiency and weight gain, and moderate development of bilateral necrotic lesions at angles of the mouth, especially in those that succumbed. Consumption of a ration with 2% of corn invaded by *F. tricinctum* resulted in death of 60 to 83% of the birds, in greatly reduced growth and feed efficiency in the survivors, and in development of severe mouth lesions. Consumption of rations containing 5, 10, and 20% of corn invaded by the fungus resulted in death of all birds in 5 to 15 days.

Wollenweber and Reinking (4) applied the name *Fusarium tricinctum* to a species within the Sporotrichiella section of the genus *Fusarium*, the section including, according to their arrangement, *F. chlamydosporum*, W. & R., *F. poae* (Pk), W. & R., *F. sporotrichioides* (Sherb.) W. & R., and *F. tricinctum* (Cda.) W. & R. Snyder and Hansen (3) grouped all of these under the name *F. tricinctum* (Cda.) S. & H., stating that the characters used by Wollenweber and Reinking to separate the several species in the Sporotrichiella section from one another were too variable to be reliable. The chief identifying character of *F. tricinctum* (Cda.) S. & H. is the production of pear-shaped microconidia by cultures on potato-dextroseagar.

There are numerous reports of toxin production by members of the Sporotrichiella section as used by Wollenweber and Reinking or of *F. tricinctum* as applied by Snyder and Hansen. Joffe (1) reported that a toxin produced by *F. sporotrichioides* growing on overwintered millet in the U.S.S.R. was responsible for a serious outbreak of poisoning in the people who consumed the millet. Isolates of *F. tricinctum* (Cda.) S. & H. from grains and from other plant parts produce a very potent toxin that has been characterized as a trichothecane and that has been designated T-2 (2). We have isolated *F. tricinctum* (Cda.) S. & H. from numerous samples of corn stored on the cob in cribs. Some of these lots of corn were suspected to have been involved in the illness of cattle, and the isolate used in the present tests (designated 2061-C in our records) was from such a lot. The aim of this work was to determine its effects on turkey poult's when consumed in the ration as it might be in practice.

Moist autoclaved corn was inoculated with isolate 2061-C of *F. tricinctum* and was incubated for 2 weeks at 22 to 25 C followed by 2 weeks at 14 C, a schedule resulting in high production of toxin (2). The corn was then dried, milled, and added to the ration as 1 to 20% of the total. The other ingredients of the ration consisted of 30 to 49% food-grade corn plus 50% turkey premix.

One-day-old Wrolstad White turkey poult's were obtained from a commercial hatchery and were kept for 1 week on a balanced ration in the test pens to detect and eliminate any weaklings and to accustom the others to the environment. They were then divided into groups and fed for 5 weeks. In the first trial, with 0, 2, 5, 10, and 20% of *F. tricinctum*-invaded corn in the ration, each group, with one exception, consisted of four replicates of five birds each in pens arranged in a Latin square design, the exception being the group of eight birds that received the ration containing 20% of *F. tricinctum*-invaded corn. In the second trial, with 0, 1, and 2% of *F. tricinctum*-invaded

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corn in the ration, each group consisted of three replicates of 10 birds each, and the
groups were distributed among the pens according to a Latin square design. The birds
were observed by one of us daily during the 5-week trial period and were weighed each week.
Birds that died during the course of the trial were necropsied, and the survivors at the end of
the trial were sacrificed and examined, and the hearts and livers were removed and weighed.

**Trial 1.** The average weight of the birds is shown in Fig. 1. None of the control birds
died; all of the birds receiving 5, 10, and 20% of *F. tricinctum*-invaded corn in the ration
died within 5 to 15 days, 12 of 20 (60%) of those receiving 2% *F. tricinctum*-invaded corn in
the ration died, and the survivors on this ration were stunted and unthrifty. Most of the
birds which died from day 10 on and most of the survivors on the ration containing 2% of
corn infected with *F. tricinctum* developed pronounced bilateral necrotic lesions at the
angles of the mouth.

**Trial 2.** The average weight of the birds in trial 2 is shown in Fig. 2. Again, none of the
controls died, 4 of 30 (13%) of those on a ration containing 1% of *F. tricinctum*-invaded corn
died, and 25 of 30 (83%) of those receiving a ration containing 2% of *F. tricinctum* died.
Feed efficiency (gram of feed per gram gain in weight) for the controls was 1.70 (about nor-
mal); for those receiving 1% of corn invaded by *F. tricinctum* it was 2.02, and for those receiv-
ing 2% *F. tricinctum*-invaded corn in the ration it was 3.28. Many of the birds developed
severe necrotic mouth lesions before death (Fig. 3). There was no significant difference
between the heart weight/body weight or the liver weight/body weight of the controls and
the two treatments.

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**Fig. 1.** Average weight of turkey poults given rations containing the indicated amount of corn
invaded by *Fusarium tricinctum* 2061-C.

**Fig. 2.** Average weight of turkey poults given rations containing the indicated amount of corn
invaded by *Fusarium tricinctum* 2061-C.

**Fig. 3.** Turkey poult which died after 21 days on ration containing 2% of corn invaded by *Fusarium
tricinctum* 2061-C, with pronounced bilateral necrotic lesions at the angles of the mouth.
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