



TRITICALE AS A FEED FOR GROWING-FINISHING SWINE

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Triticale is a rye-durum hybrid which has received considerable publicity as a potential grain crop for North Dakota and other areas. The predicted agronomic potential of this new plant species has attracted the interest of commercial seed companies, and it is apparent that significant amounts of seed will be available for planting in the near future. It is therefore imperative that North Dakota farmers and ranchers have sufficient information available to properly evaluate this new grain under their circumstances.

Reviews of the history of triticale and its value in poultry rations have been published by Sell and Johnson (1969) and Sell *et al.* (1962). Triticale was

reported to have a value approximately equal to that of hard red spring wheat in chick starter rations (Sell *et al.*, 1962) and was comparable to durum as a feed for young turkeys (Sell and Johnson, 1969). Michigan workers (Bixler *et al.*, 1968) reported that triticale was comparable to rye but inferior to corn and wheat in chick starter rations.

Researchers at the University of Manitoba have considerable experience with triticale, and the results of feeding this grain to swine have been reported by Stothers and Shebeski (1965). These workers indicated that palatability was a problem with triticale grown in 1962 and 1964 but not in triticale grown in 1961. A maximum triticale level of 30 per cent of the basal feed for finishing rations was suggested by the Manitoba researchers.

It is apparent that the estimates of the value of triticale as a feed for livestock vary, with possible causes being location and year of production.

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Procedure

The triticale available for the three experiments was fed to growing-finishing swine and was incorporated into standard growing-finishing rations as either 50 per cent or 100 per cent of the basal feed (Table 1). While the crude protein level of triticale is normally slightly higher than that of barley, no attempt was made to keep the crude protein content of the rations constant. Therefore, the rations containing triticale may have had the advantage of higher crude protein content. All rations fed in these experiments were ground and pelleted.

Table 1. Composition of Rations.

Ingredient	Ration Number		
	1	2	3
Barley	86.90	43.50	86.90
Triticale		43.50	86.90
Soybean Meal	10.90	10.90	10.90
Dical.	0.85	0.85	0.85
Limestone	0.75	0.75	0.75
T. M. Salt	0.50	0.50	0.50
Vitamin Premix	0.10	0.10	0.10
ZnO	3.5 gm	3.5 gm	3.5 gm
	100.0	100.0	100.0

Av. Chemical Analysis

Crude Protein	15.5	16.3	16.7
Phosphorous	0.59	0.58	0.58
Fiber ¹	7.4	6.3	6.0

¹Fiber analysis determined by the acid-detergent fiber method.

The pigs used in all experiments were assigned to pens on the basis of breed, sex, litter and initial weight. Rations were then randomly assigned to pens within replicates.

Rations fed in Experiment I were the barley (basal) diet or rations in which triticale comprised 50 per cent or 100 per cent of the grain mix. Each ration was fed to six pigs having an average initial weight of approximately 56 pounds. This experiment was terminated after 91 days. The triticale fed in Experiment I was grown in 1968 and had not been cleaned.

Experiment II involved feeding triticale grown in 1968 and 1969. The triticale from the 1968 crop year had been cleaned while that grown in 1969 had not been cleaned. The cereal grain portion of the rations fed in this trial were: (1) barley; (2) a mixture of half barley and half triticale grown in 1969; (3) triticale grown in 1969 (uncleaned); or (4) triticale grown in 1968 (cleaned). All rations were fed to two lots which initially contained six pigs with an average weight at the start of the experiment of approximately 66 pounds. This experiment was terminated after 45 days.

Uncleaned triticale from the 1969 crop year was also fed in Experiment III. The grain mixture

of the rations fed in Experiment III contained barley, a combination of equal parts of barley and triticale, or only triticale. Each ration was fed to three pens of pigs, each pen containing six pigs with an average initial weight of approximately 86 pounds. Experiment III was terminated when the average weight of the heaviest treatment group exceeded 200 pounds (after 77 days).

Results

Experiment I: The inclusion of uncleaned triticale from the 1968 crop at either 50 per cent or 100 per cent of the grain mix in rations for growing-finishing swine resulted in a dramatic reduction in feed intake and average daily gain. Feeding triticale as the sole component of the grain mix produced the most severe reduction in performance.

Table 2. Experiment I - Summary of Results¹.

Item	Grain Mixture		
	All Barley	50% Barley 50% 1968 Triticale	All 1968 Triticale
No. of Pigs	6	6	6
Av. Initial Wt.	55.7	55.8	56.6
Av. Final Wt.	192.8	172.8	157.5
A.D.G. ²	1.51	1.29	1.11
A.D.F. ³	5.37	4.50	4.20
F/G Ratio ⁴	356	350	379

¹Experiment terminated after 91 days.

²A.D.G. equals average daily gain.

³A.D.F. equals average daily feed consumption.

⁴F/G Ratio equals pounds feed required per 100 pounds weight gain.

Efficiency of feed utilization was not markedly altered by the inclusion of triticale in the rations, indicating that palatability may have been the factor which limited feed intake, with the reduction in weight gain resulting from the decreased feed consumption.

The triticale used in this experiment contained ergot, and it is not possible to determine from these data if the effects previously noted were due to the ergot, the triticale, or both.

Experiment II: The most rapid weight gains in this experiment were obtained by feeding the pelleted barley ration. It is significant to note that a definite effect due to year of production was apparent when rations containing triticale were fed. Triticale grown in 1969 produced results quite comparable to those obtained when the barley ration was fed.

Table 3. Experiment II - Summary of Results¹.

Item	Grain Mixture			
	Barley	50% Barley 50% 1969 Triticale	1969 Triticale Uncleaned	1968 Triticale Cleaned
No. of Pigs	12	11 ²	10 ³	12
Av. Initial Wt.	66.8	67.4	64.2	65.7
Av. Final Wt.	134.2	131.8	129.7	122.0
A.D.G. ⁴	1.50	1.43	1.45	1.25
A.D.F.	4.58	4.76	4.75	3.99
F/G Ratio	318	332	326	319

¹Experiment terminated after 45 days.
²One pig removed because of lameness.
³One pig removed because of lameness, one pig removed because of severely bitten tail.
⁴Abbreviations explained in Table 2.

Cleaned triticale from the 1968 crop was inferior to barley or triticale grown in 1969 as the sole grain for growing pigs. This effect was again most apparent in the reduction in average daily feed intake. Efficiency of feed utilization was not markedly different between the experimental rations.

Experiment III: Average daily gain was again highest for pigs fed the ration based upon barley and lowest for the animals fed the ration in which triticale was the only cereal grain. Average daily feed intake followed the same pattern.

Efficiency of feed utilization may have been influenced by the source of barley available and the environmental temperature. The initial supply of barley was exhausted near the completion of the experiment, and a new supply was purchased which had an extremely low crude protein content. This barley was fed only to the pigs receiving the basal barley ration during the last 14 days of the experiment, resulting in a severe drop in average daily gain of the control animals. The weather was extremely warm and dry during the latter stages of

Table 4. Experiment III - Summary of Results¹.

Item	Grain Mixture		
	Barley	50% Barley 50% 1969 Triticale	1969 Triticale
No. of Pigs	18	18	18
Av. Initial Wt.	86.1	86.0	85.9
Av. Final Wt.	200.4	195.3	178.1
A.D.G. ²	1.53	1.46	1.23
A.D.F.	5.83	5.31	4.55
F/G Ratio	381	363	360

¹Experiment terminated after 77 days.
²Abbreviations explained in Table 2.

the experiment, and would be expected to affect the heavier animals (those fed rations containing barley) most severely. The apparent differences in efficiency of feed utilization may have been caused by the change in barley sources and climatic conditions.

Discussion

In general, the barley rations produced more rapid weight gains than rations containing triticale. Rations in which triticale comprised only half of the grain mix were, with one exception, quite comparable to the barley rations and were usually superior to rations in which triticale was the sole grain. Differences in weight gain appeared to be indirect effects produced by changes in feed intake. Ergot infestation of the triticale was less severe in 1969 than in 1968, but it is not possible to determine from these data whether reduced feed intake was due to the triticale, the ergot contamination, or to a combination of the two factors.

Until further research can be conducted, it is recommended that triticale be limited to a maximum of 25 per cent of the ration for growing pigs (50 to 130 pounds) or 50 per cent of the grain mixture for finishing pigs (130 pounds to market weight). Triticale cannot be recommended at this time as an ingredient in rations for breeding stock or for young pigs.

Summary

Three experiments involving a total of 117 growing-finishing pigs were conducted to evaluate the acceptability of triticale as a feedstuff for pigs from 50 pounds to market weight.

Year of production of the triticale had a marked effect upon acceptability of the new grain in one trial. In general, triticale appeared to be somewhat unpalatable to growing-finishing swine and the reduced feed consumption resulted in less rapid weight gain of the pigs fed rations containing triticale.

The apparent palatability problem severely limits the acceptability of triticale as a feedstuff for growing-finishing swine.

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