



www.canadianpoultrymag.com

December 2006

CANADIAN  
**POULTRY**

LA REVUE CANADIENNE D'AVICULTURE

MAGAZINE



**Drug-free  
Production**

It can be achieved

**SUPPLY MANAGEMENT:**

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# Drug-free Turkey Production

Results from Ontario farm show it can be achieved with minimal extra production costs

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**D**rug-free commercial poultry production is increasingly in demand. This demand is driven in part by: necessity, such as with the regulatory changes in the European Union countries; life-style of the "green" or "organic" consumers; public anxiety over scientific evidence showing the persistence of some antibiotic resistance traits in bacteria recovered from poultry products purchased in supermarkets, and by the added premiums required on prices of drug-free poultry in selected markets.

However, the increase in production cost associated with drug-free poultry production has been cited as the main reason for the reluctance of producers to satisfy this demand. The additional costs associated with drug-free commercial poultry production can include: increases in the floor space needed to raise antibiotic-free chicken (up to 50 per cent increase); increased incidence of other poultry diseases as a consequence of poorer control of coccidiosis with the use of vaccines; increased use of antibiotic treatments in drinking water (particularly in EURO countries where bacterial disease has been shown to increase as a result of drug-free diets); and the reluctance of the processors and consumers to pay a premium on these cost increases.

Therefore, one way of lessening the level of argument of the pros and the cons on the production of drug-free poultry is to produce commercial chickens or turkeys with little or no increase in the costs of production.

## It Can Be Achieved

Here we report on the production of 42 consecutive flocks of turkey hens on an Ontario farm in Canada, which perhaps can be used as evidence to show that such production can indeed be achieved.

A total of 469,317 hens were raised on drug-free commercial diets over a period of 3.5 years with little increase in the cost of production. No anticoccidials or antibiotics were used in feeds or water over this production period. For coccidiosis control, a turkey coccidiosis vaccine was used.

## Drug-free Production in Detail

### Turkey Hens:

All hens were supplied according to

availability by local or U.S. hatcheries over the 3.5-year period. They were not beak trimmed but were declawed and were vaccinated against coccidiosis on day one. All hens were raised to 11 weeks of age and usually shipped in two lots, one day apart.

### Commercial Diets:

All drug-free feeds were supplied by one local feed mill. The bulk feeds requested were medium feeds or in a feed grade between high performance (XL) and basic feeds. Feed components are listed in Table 1.

### Coccidiosis Vaccination:

All poulters were vaccinated with IMMUCOX® (Vetech) coccidiosis vaccine at day one with a ratio of one puck (~ 100 gm) per 100 poulters.

### Water:

Well water chlorinated at 7.5 ppm (1 oz./50 gallons) in the tank was used throughout the growing period. Water was pumped from the well into a 250 gallon plastic tank.

Polytonine-A or a vitamin booster added to the water was used for the first week.

### Brooding:

Poulters were brooded at 400 birds per four-metre ring. Five supplementary gallon-jugs were added to each ring to supplement the Plasson drinker in the middle. Birds were kept in the brooding rings for up to seven days and then released to the whole barn.

### Barns:

The farm is on an HACCP program certified by the Canadian Turkey Marketing Association (CTMA) as part of the Ontario Food Safety Program. The farm is situated in a remote area of Ontario. There are four buildings; two in each of the two 100-acre farms about 0.5 km apart. Each building has two separate barns with a common working area in the middle. There is a refrigerator, a sink and a working bench set up as in like a kitchen, as well as a shower.

There are two rows of feeders and three rows of Plasson drinkers in each barn. The barns are either 50 x 200 feet (15 m x 60 m) or 45 x 250 feet (13.6 m x 75.7 m) or 10,000 sq. ft. per barn (~ 1,000/m<sup>2</sup>).

### Floor Space:

Each poult was allowed approximately 1.75 sq. ft. (6.2 birds/m<sup>2</sup>), similar to other commercial farms. Ventilation was provided in a similar manner to other commercial barns in the province.

### Management:

All on-farm services were provided by the three owners of the farm, and thus there was little or no problem with visitors during the growing period other than the feed truck drivers and the feed marketing representative. At market time, the catching crew members were the only other visitors to the farm.

Visual inspection of the birds, feed and water and equipment inspection was carried out twice daily and the litter was tilled daily to prevent caking. This was done manually for the first few weeks but mechanically thereafter.

### Production Results:

From June 2002 to December 2004, a total of 343,362 hens in 31 flocks were raised on this Ontario farm (Table 2) to an average of 11 weeks or 77.5 days. The liveability averaged 96.11 per cent over these 2.5 years with a feed conversion of 2.10 and hens weighing on average 4.93 kg.

Ontario data available on over three million hens raised for about the same average age (77 days), the liveability was slightly lower, but the average weight was higher, 5.27 kg adjusted, with about the same feed conversion ratio (2.11).

When the costs of performance were compared between these two values, (as calculated in Table 3), the drug-free hens' cost only averaged 5.5¢ per hen, or roughly 1¢ per kg raised. Due to such a negligible extra cost, there was no need for a premium on these drug-free turkeys. Even in countries such as the U.S., where both anticoccidials and antibiotics are sold at half the price, the added cost will still only be doubled to 2¢ per kg of turkey sold at farm gate.

When the results from the 11 flocks (reared in 2005) were compared with the performance of hens at another farm, similarly vaccinated with IMMUCOX® but fed with growth promotants until market, they appeared to compare favourably (+29¢/bird).

During the 3.5 years in the drug-free

farm, no significant health problems that required veterinary treatment, including coccidiosis, were ever observed.

This report of consistent performance without any medication added to the water or the feed clearly suggests that drug-free poultry can be raised with a minimum of cost increases. Although no premium compensation was demanded, we feel that it should be given as an incentive for raising these drug-free birds.

### Why Drug-free Hens Could Be Raised Successfully On This Farm

There are many factors contributing to raising drug-free hens successfully on this farm rather than on many other farms in Ontario. Among the factors in declining importance are: the isolation of the farm and barns, biosecurity, good management and a problem-free coccidiosis vaccine.

This farm is located in a rural area of Ontario where the nearest town is half an hour away. The farm is made up of two parcels of land, 40-hectares (100 acres) each and each parcel is situated by itself. Two of the four barns (15 x 60 metres) were new and situated about one kilometre apart on one of the 40-hectare plots. Of the remaining two barns, one was a two-storey barn and both were 13.6 m x 75.7 m (45' x 250') with a working shed and a farmhouse.

The isolation of the barns was likely the most important factor in keeping the turkey production drug-free. Also, visitors were limited and all barn tasks were performed and managed by the three owners. Careful attention was given at all times to the growing birds.

### Good Coccidiosis Control Is Key

The absence of any problems with coccidiosis or necrotic enteritis showed that the turkey coccidiosis vaccine administered was highly effective in controlling coccidiosis in the 42 flocks over the 3.5-year period. An important contributing factor was floor space. With each hen having between 1.75 to 1.8 sq. ft. of floor space, this most likely facilitated with the "thinning" out of sporulated oocysts. There was an intrinsic factor on the turkey *Eimeria* themselves: both constituent species were immunogenic but not highly pathogenic.

### Conclusion

Effective control of coccidiosis is therefore an essential part of lowering the cost of all drug-free programs as observed previously and again provided in this report. Therefore, improving on coccidiosis vaccination will substantially reduce the production costs of raising drug-free poultry. ☺

**TABLE 1: FEEDING PROGRAM FOR STANRIKA FARMS, ORILLIA, ONTARIO  
FEED SUPPLIED BY NEW LIFE MILLS LIMITED**

RATION	CRUDE PROTEIN	CRUDE FAT	CRUDE FIBRE	CALCIUM	FORM	PROGRAM KG PER BIRD	ACTUAL AVERAGE KG PER BIRD
MM Fem Starter #1	27.00%	4.00%	4.00%	1.40%	Crumbles	0.70	1.11
MM Fem Starter #2	26.00%	4.00%	4.00%	1.35%	Crumbles	2.00	2.45
MM Fem Grower #1	23.00%	6.00%	4.00%	1.24%	Pellets	2.50	2.92
MM Fem Grower #2	20.50%	7.00%	4.00%	1.20%	Pellets	3.00 to shipping	2.98
MM Fem Finisher #1	19.50%	8.00%	4.00%	1.10%	Pellets		1.15

Table 2: Performance of consecutive flocks of turkey hens on drug-free diets compared to provincial averages

**Available Ontario averages are in bold type**

a) Farm #1 b) Farm #2

Year	# Placed	# Flocks	Age (days)	Liveability	Av. Wt. (kg)	F/C	Condemnation
2002-2004	343,362 a	31	77.5	96.11	4.93	2.10	0.60
2002-2004	<b>2 million</b>	-	<b>77</b>	<b>94.2</b>	<b>5.24 (5.27)</b>	<b>2.11</b>	<b>0.75</b>
2005	125,955 a	11	75.4	95.01	5.13	2.11	0.93
2005	101,795 b	10	70.5	92.68	4.86 (5.28)	2.22	0.83

Table 3: Calculation Rationale for comparing the performance of the drug-free hens with the Ontario average

- A) If the smaller bird (4.93 kg) were to grow to the same weight as the larger bird (5.27 kg), it would require an additional amount of feed:  $(5.27 - 4.93) \times 2.10 = 0.714$  kg.
- B) Being a more efficient (2.10) smaller bird (4.93) it actually needed less feed to grow to the same weight (4.93 kg) by:  $4.93 \text{ kg} (2.10 - 2.11) = -0.0493$  kg.
- C) The difference to make up from the more efficient (low feed conversion) smaller bird to the heavier but less efficient birds the amount will be:  $(5.27 - 4.93) \times 2.10 + 4.93 (2.10 - 2.11) = 0.714 \text{ kg.} - 0.0493 \text{ kg} = 0.6647$  kg.

Think of it this way: The same amount of needed feed can be obtained by simply finding the difference between the ratios as shown below of the two comparison sets of value, as shown below:

$$\begin{array}{r} 4.93 \quad 2.10 \\ \times \quad \times \\ 5.27 \quad 2.11 \end{array} \quad \text{or} \quad 5.27 \times 2.10 - 4.93 \times 2.11 = 0.6647 \text{ kg}$$

Then the actual market cost of this difference will be:  $0.6647 @ \$0.256/\text{kg} = 17 \text{ ¢ / hen}$

Due to the fact that the birds were given feed that did not contain any anticoccidial or antibiotics, the farm paid 12 ¢ less per hen for the feed. The cost of the coccidiosis vaccine was offset by the absence of beak trimming.

$17 \text{ ¢} - 12 \text{ ¢} = 5.54 \text{ ¢ / hen additional, or } 1 \text{ ¢ / kg}$