

# Choosing Breeds for Producing Profitable Market Lambs

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The Ontario sheep industry has not determined an optimum production system for profitability. There has also not been research done in Ontario conditions to determine what specific breeds and breed crosses will result in the most profitable enterprise to produce today's premium lamb. New entrants to the industry are faced with a large number of breeds to choose from and little objective data. As a result, new producers should have a strong business plan formulated before choosing breeds.

If you are starting in the sheep industry, it is important that the production system and the market product for your business has been determined before choosing the breed or breeds of sheep that will be used in the operation. It is much easier to evaluate your resources, choose a production system and then choose a breed of sheep that will fit that system than it is to try and fit a breed into a production system that it may not suit.

## Production Systems

The two main commercial production systems in Ontario are annual spring lambing and accelerated lambing. Annual spring lambing is an extensive, low cost production system that is based on having a large flock that lambs when the highest feed requirements of the flock can be met using pasture. Accelerated lambing is a more intensive system based on prolific ewes and high production that aims to produce market lambs and cash flow throughout the year.

Annual lambing profitable enterprise characteristics:

- Lamb once a year in April or May to maximize the use of grass and the conception rate and fertility of the ewes.
- Rely on hardy breeds or breed crosses with the following traits:
  - very strong mothering ability
  - excellent foraging ability
  - medium fecundity

Accelerated lambing profitable enterprise characteristics:

- Lamb 3- 5 times a year, timed to take advantage of best months for conception and fertility of ewes, maximizing use of pasture and use of buildings
- Rely on prolific breeds or breed crosses with the following traits:
  - high fecundity (lambing percentage)
  - early maturity
  - extended breeding season

## Common Breeds

The most common breeds in Ontario are Polled Dorset, Suffolk, Rideau Arcott and their crosses. This is based on the most popular breeds tested on the genetic evaluation program, the Sheep Flock Improvement Program (SFIP). Another indication of what breeds are being used in Ontario is the breed registration numbers. These same breeds have the highest registration numbers.



### 2008 Ontario Sheep Registrations – Canadian Sheep Breeders Association

Breed	# Sheep Registered	% of Registrations
Dorset	640	22.4
Hampshire	118	4.1
North Country Cheviot	151	5.3
Rideau Arcott	342	12.0
Suffolk	642	22.5
Texel	219	7.7
20 other breeds	740	26.0
Total Ontario Registrations	2852	100.0

The benefit of choosing among the common breeds to start your flock is general availability and more accurate average performance information. There are more animals available for purchase providing more potential numbers as well as choice among breeders. There is also better Ontario performance information available.

#### Breed Performance

It is important to have good expected average performance information when choosing breeds and formulating your business plan. *Although there is information on many breeds listed in the table below, a number of breeds are only represented in one flock by very few ewes. As a result, the performance listed for breeds with little data may not be an accurate indication of average breed performance.*

## Average Breed Performance 2008 – Sheep Flock Improvement Program

Breeds	# Ewes	# Born	# Lambings	Ave Born Per Lambing	Ave Weaned Per Lambing	Ave Birth Wt (kg)	Ave Adj 50 Wt (kg)	Ave Adj 100 Wt (kg)	Ave ADG (kg)	Ave # Lambings/Ewe/Yr
Border Leicester	30	38	30	1.27	1.20	4.5	22.5	n/a	n/a	1.00
Canadian	15	24	15	1.60	1.00	4.8	20.8	39.9	0.38	1.00
Charollais	79	134	79	1.70	1.56	5	25.6	43.5	0.36	1.00
Corriedale	9	20	15	1.33	1.33	4.9	28.0	46.4	0.37	1.67
Dorset Horn	34	53	35	1.51	1.40	3.8	22.5	35.8	0.27	1.03
Dorset Polled	729	1217	794	1.53	1.44	2.6	25.0	38.2	0.26	1.09
East Friesian	60	124	60	2.07	1.73		23.8	39.1	0.30	1.00
Hampshire	37	59	37	1.59	1.57		28.6	48.0	0.39	1.00
Katahdin	58	109	66	1.65	1.53	3.9	21.1	32.7	0.22	1.14
North Country Cheviot	28	42	29	1.45	1.38		22.8	40.9	0.36	1.04
Newfoundland	24	38	24	1.58	1.29	3.6	17.9	24.5	0.13	1.00
Oxford	14	27	14	1.93	1.71		24.4	46.1	0.44	1.00
Rambouillet	24	26	24	1.08	0.96	4.6	20.3	25.3	0.09	1.00
Rideau	2297	6235	2809	2.22	1.92	3.1	21.6	39.2	0.35	1.22
Shropshire	14	24	14	1.71	1.64		27.3	41.1	0.28	1.00
Suffolk	407	641	408	1.57	1.41	5.1	25.6	44.5	0.37	1.00
Soay	2	3	2	1.50	1.00	2.1	20.3	19.6	0	1.00
Texel	142	204	142	1.44	1.32	4.6	22.6	35.5	0.23	1.00
Crossbred	1699	3794	2019	1.88	1.64	4.2	21.2	31.8	0.21	1.19
Total	5831	13176	6817	1.93	1.70	3.7	22.4	38.4	0.31	1.17

### Choosing Breeds

A profitable commercial sheep operation should take advantage of the benefits of crossbreeding. Crossbreeding increases the efficiency of the operation by crossing two breeds which have high genetic merit for different traits. Maternal traits or reproductive traits tend to be negatively correlated to terminal or growth and carcass traits. An example of this is that an animal that has more lambs born and more milk will tend to be less muscular with poorer feed conversion and gaining ability. There is a reason why there isn't a sheep breed that has as many lambs as a Romanov and is muscular like a Texel. It is difficult if not impossible to produce a sheep that is exceptional in both maternal and terminal traits.

### Ewe Flock

In general, the ewe flock should be made up of medium to small ewes with good reproductive traits rather than large ewes that grow fast in order to control the largest cost for the enterprise which is the feed cost. Larger ewes cost more to feed per year than smaller ewes. Approximate ewe weight ranges are: small – 50-65kg, medium - 65-80kg and large 80+kg. If you use a crossbreeding program, the maternal ewe flock must

be maintained. As a result, maternal type rams must always be used in the flock to increase flock size and to produce replacement ewes for cull ewes leaving the flock.



### **Examples of maternal breeds**

*Prolific:* Finn, Rideau, Polpay, Romanov, Outaouais

*Hardy:* North Country Cheviot, Border Leicester

*Extended Season:* Dorset, Finn, Rideau, Polpay, Romanov, Outaouais, Corriedale, Rambouillet, Columbia

### **Market Lambs**

Growth rate and size of market lambs can be adjusted by crossbreeding. It is important to remember that the average performance of the progeny will be approximately the average performance of the two parents.

Ontario has a market for several different weight classes of lamb. Lambs should be marketed when they have an optimum level of finish or carcass fat. The proportion of carcass fat is different between breeds and sexes but is most affected by degree of maturity or percent of mature weight at slaughter. Research done by Dr. Eric Bradford of the University of California in 2002 suggests that lambs should be marketed at a maximum of 60-70% of the average of the mature weights of the ewes of the sire and dam breeds to avoid overfatness. The American Sheep Industry Association defined lean lamb as having a backfat thickness at the 12<sup>th</sup> rib of .10 - .25 inches. The American market prefers a slightly fatter carcass than markets in Ontario. As a result, in Ontario a maximum of 50% of the average of the mature weights will work better. The table below provides a guide to approximate slaughter weights based on the mature size of the ewes of the breed. The table was developed using ewe and wether information on diets relatively high in energy.

### **Target slaughter weights<sup>a</sup> for ewe and wether lambs produced from sire and dam breeds of varying mature weights**

Ewe breed mature wt	Sire breed mature weight (kgs)												
	105	100	95	90	85	80	75	70	65	60	55	50	45
105	52.5	51.3	50.0	48.8	47.5	46.3	45.0	43.8	42.5	41.3	40.0	38.8	37.5
100	51.3	50.0	48.8	47.5	46.3	45.0	43.8	42.5	41.3	40.0	38.8	37.5	36.3
95	50.0	48.8	47.5	46.3	45.0	43.8	42.5	41.3	40.0	38.8	37.5	36.3	35.0
90	48.8	47.5	46.3	45.0	43.8	42.5	41.3	40.0	38.8	37.5	36.3	35.0	33.8
85	47.5	46.3	45.0	43.8	42.5	41.3	40.0	38.8	37.5	36.3	35.0	33.8	32.5
80	46.3	45.0	43.8	42.5	41.3	40.0	38.8	37.5	36.3	35.0	33.8	32.5	31.3
75	45.0	43.8	42.5	41.3	40.0	38.8	37.5	36.3	35.0	33.8	32.5	31.3	30.0
70	43.8	42.5	41.3	40.0	38.8	37.5	36.3	35.0	33.8	32.5	31.3	30.0	28.8
65	42.5	41.3	40.0	38.8	37.5	36.3	35.0	33.8	32.5	31.3	30.0	28.8	27.5
60	41.3	40.0	38.8	37.5	36.3	35.0	33.8	32.5	31.3	30.0	28.8	27.5	26.3
55	40.0	38.8	37.5	36.3	35.0	33.8	32.5	31.3	30.0	28.8	27.5	26.3	25.0
50	38.8	37.5	36.3	35.0	33.8	32.5	31.3	30.0	28.8	27.5	26.3	25.0	23.8
45	37.5	36.3	35.0	33.8	32.5	31.3	30.0	28.8	27.5	26.3	25.0	23.8	22.5

<sup>a</sup> Target slaughter weight = ((sire breed mature wt. + ewe breed mature wt.)/2) x .50

Terminal sires should be chosen to complement your ewe flock and produce the best carcass and growth rate for your production system and chosen target market.

Crossbreeding also results in heterosis. Heterosis is an increase in the performance of progeny compared to the average of the parents. One important thing to remember is that if the two parental breeds are not similar in performance for a trait, the lamb will not be better than both parents, it will only be better than the average of the two parents. For example, if you cross Finn sheep with an average of 2.5 lambs per lambing and a growth rate of .25kg/day with a Suffolk who has 1.6 lambs per lambing and a growth rate of .50kg/day. The Finn ewes may have 2.5 lambs that grow an average of .40kg/day (ave of parents = .375kg/day) and the Finn cross Suffolk ewe lambs if you keep them may have 2.1 lambs per lambing on average (ave of parents = 2.05 lambs). In the literature, positive heterosis effects have been reported consistently for pre-weaning survival and growth traits. There is little evidence of any heterosis effect on carcass traits. The small heterosis effects on different traits when using crossbred lambs accumulate and result in significant differences in overall productivity. This example shows how the growth rate of market lambs can be easily improved by using a fast growing terminal sire.



**Examples of terminal breeds:**

Dorset, Canadian, Charollais, Southdown, Texel, Oxford, Hampshire, Suffolk, Ile de France

**Conclusions:**

It is most important to formulate your farm business plan and choose your production system before deciding what breed or breeds of sheep will best fit your operation. The best breed of ewe will be a small to medium sized ewe that will produce the most efficiently to fit your production system. Sires will usually be required to produce replacement ewe lambs for the flock as well as market lambs. The best terminal sire to produce your market lambs will improve the growth and carcass traits of your lambs.

**References**

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