

Semex's crossbreeding program, TopCross™, offers a valuable solution by harnessing the heterosis of a two or three breed rotation.

The TopCross™ strategy recommends a rotation of Holsteins, Canadian Ayrshires and Jerseys, based on results from a five year research program. This research program was supervised by Dr. Ted Burnside, Prof. Emeritus, University of Guelph with data collected by Canwest DHI, Canadian Dairy Network and classification conducted by Holstein Canada.

Results of the research program reinforces the benefits of crossbreeding as:

- **Higher Fertility** - Reduces calving intervals, semen, vet and AI costs
- **Calving Ease** - Fewer stillbirths, less stress, more live progeny
- **High Fat and Protein** - Crossbred yields are very similar to Holstein
- **Hard-wearing Feet** - Increases lifespan and reduces lameness
- **Calf Vitality** - Easy, trouble-free calf rearing
- **Greater Mastitis Resistance** - Healthy cows with a reduction in vet & drug costs
- **Higher Survival** - More than 10% advantage over purebreds from birth to 2nd calf
- **Stronger Immune System** - OVC Research verified 9% - 40% higher immune response in crosses vs. purebreds!



# TopCross™

Semex's TopCross™ crossbreeding plan provides maximum hybrid vigor combined with the best traits of these breeds:



## HOLSTEIN

A source of strength, high milk production and functional udders.



## CANADIAN AYRSHIRE

Respected worldwide for excellent conformation, with diverse pedigrees including Swedish and Finnish Red sires, leading to an extensive emphasis on fertility, Somatic Cell Count, longevity and calving ease.

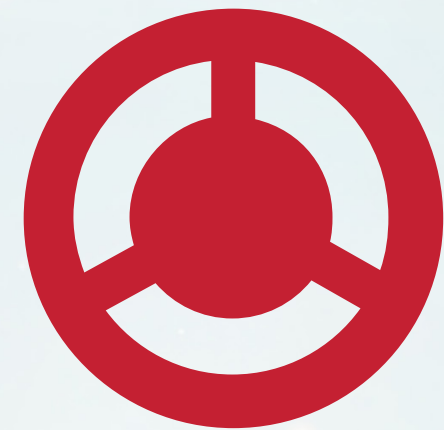


## JERSEY

Known to excel in economic performance of components and efficient feed conversion.



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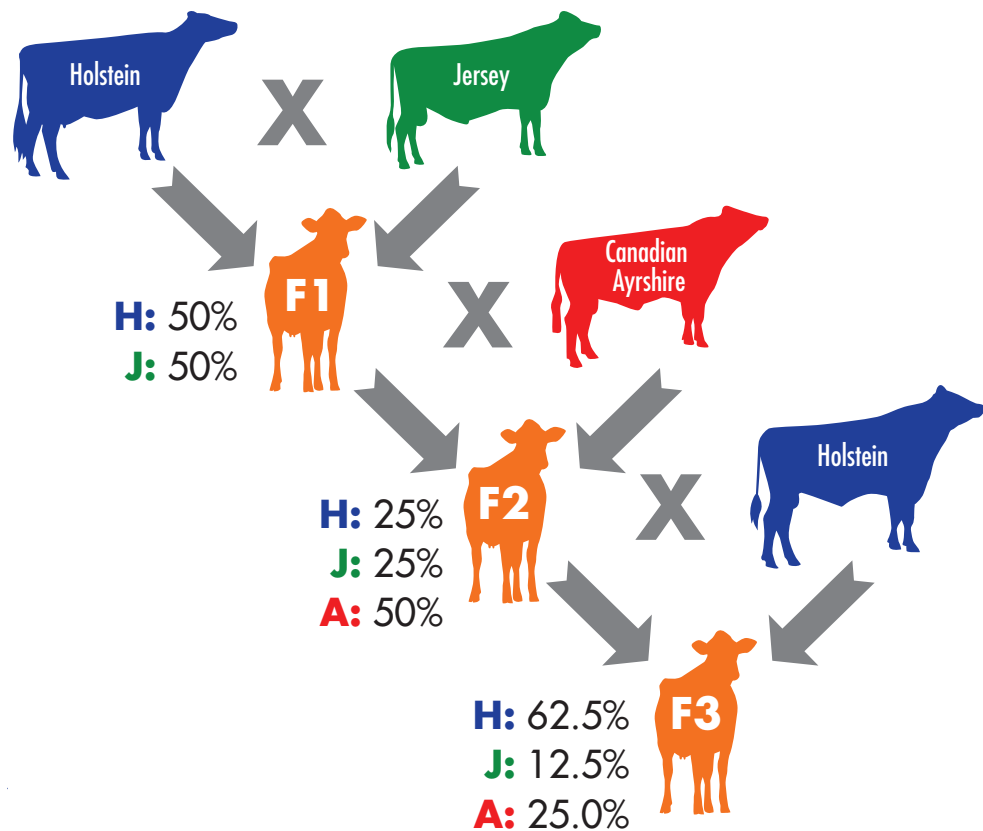
# TOPCROSS™

## CROSSBREEDING FOR PROFIT

Working with dairymen around the world, Semex is developing and marketing the highest quality genetics, programs and services designed to increase profitability.



# SEMEX'S CROSSBREEDING PLAN



# RESULTS FROM FIVE-YEAR RESEARCH PROGRAM

Holstein Cows Mated To:	56-Day Non-Return Rate*
Ayrshire Sires	71.7%
Brown Swiss Sires	65.1%
Jersey Sires	71.1%
Norwegian Red Sires	70.2%
Holstein Sires	60.0%

Source: CDN Study November 2006. \*Non-Return Rate is equivalent to Conception Rate.

### Conclusion:

- Crossbred matings achieved an extra 4-14% non-returns compared to Holstein x Holstein herds.

## What About Conformation?

**Table 3:** Conformation measurements of Holstein herdmates and crossbreds out of Holstein dams based on heifers scored by official classifiers

Official Classifier Conformation Measurements (inches)					
Breed of sire	AY	BS	HO	JE	NRF
Rump Angle	-1.7	-1.7	-1.6	-1.2	-1.7
Pin Width	7.0	7.1	7.4	7.3	7.2
Udder Depth	3.9	3.5	3.9	3.2*	3.2*
R. Attach. Height	8.7	9.2*	8.7	8.6	9.1*
R. Attach. Width	5.2	5.4	5.2	5.4	5.1
Teat Length	1.5	1.6	1.5	1.7	1.5
Hip Height	57.1	57.8	57.7	55.2*	56.2*

Source: P. Glover, 2010. M.Sc. Thesis, University of Guelph

\*Significantly different at  $p < 0.05$  after correction.

### Conclusions:

- Ayrshire and Jersey crosses will compliment many of today's herd management systems

## Crossbreds Are More Fertile & Easier Calving!

### 2010 University of Guelph Study

**Table 1:** Comparison of F1 heifers from Holstein dams by breed of sire.

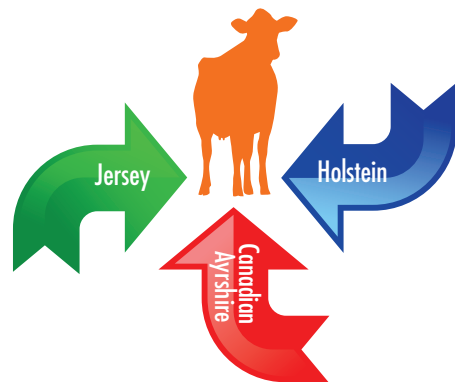
Breed	Age at 1st Service	Non-Return Rate %	No. Services	1st Service Conception	Gestation Length	Calving Ease	Stillbirth %	Calf Size (0-3)
AY	-4.3	1.97	0.09	7.7	-2.1	-0.16	-7.29	-.11
BS	-0.2	1.92	-0.06	-0.3	2.6	-0.16	-3.89	-.03*
JE	4.4	3.17	-0.06	-1.0	-0.7	-0.23	-2.13	-.40*
NR	-7.5	5.28	-0.13	-2.2	-1.4	-0.12	-5.30	-.07

Source: P. Glover, 2010. M.Sc. Thesis, University of Guelph

\*Significantly different from Holstein sires at  $p < 0.05$ .

## Two or Three Breed Crossing with Holsteins, Ayrshires or Jerseys

1. Start by mating Holstein yearlings to Jersey sires for easy calving
2. Mate F1s (Holstein x Jersey) to Ayrshire
3. Mate 3-way cross heifers to Holstein and rotate 3 breeds



## CROSSBREEDING FOR PROFIT

## What About Production?

### 2010 University of Guelph Study

**Table 2:** Holstein herdmate and crossbred daily production (actual lbs) and 305 day differences

Breed	Daily Production Actual (lbs)			Holstein 305 Actual and differences (lbs)			SCC (X 1000)
	Milk	Fat	Protein	Milk	Fat	Protein	
HO +	61.8	2.3	2.0	20,084	746	629	401
AY +	61.5	2.4	2.1	+433	+26	+31	399
BS +	58.9	2.3	2.0	+224	+25	+25	409
JE +	52.9	2.3	1.8	-711	+36	+5	422
NRF ++	61.1	2.3	2.0	+163	+13	+15	400

+ P. Glover, 2010. M.Sc. Thesis, University of Guelph. ++ P. Glover\*, J. Fatehi\*, E.B. Burnside†, L.R. Schaeffer, 2011. Centre for Genetic Improvement of Livestock, University of Guelph and †Gencor. No Significant Difference in Daily Yield or SCC/SCS. Fat and Protein Yield Slightly but not Significantly Higher. Actual 305 day Yields Influenced by Lactation Curves

### Conclusions on 1st Lactation Data:

- Crossbred Heifers Milked as Well as Holstein Contemporaries
- Fat and Protein Slightly Higher
- Somatic Cell Counts Similar

## Will Crossbreds Survive?

**Table 4:** Survival of Holstein herdmates & crossbreds from birth to 2nd calving

Breed of Sire	Birth - 1st AI	1st AI - 1st Calf	1st Calf - 2nd Calf	Birth-2nd Calf %
AY	.84	.93	.79	62.7%
BS	.77	.96	.71	52.5%
HO	.80	.91	.68	50.0%
JE	.68	.89	.68	41.2%
NRF +	.82	.94	.53	40.9%

Source: P. Glover, 2010. M.Sc. Thesis, University of Guelph

### Conclusions on preliminary data as research is still in progress:

- These results may be biased by incentives
- Ayrshire crosses are high survivors