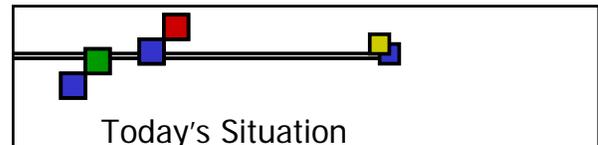


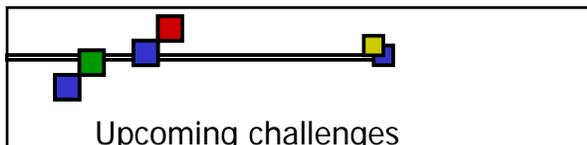
## National DNA Bank for Swine Why do we need it ?

  
 Pramod Mathur  
 Canadian Swine Breeders Association  
 Canadian Centre for Swine Improvement



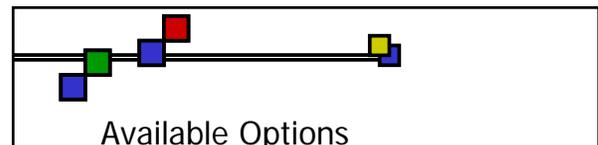
## Today's Situation

- Remarkable genetic improvement in growth, carcass quality and sow productivity through quantitative selection
- Major Canadian breeds free from RN and Halothane gene
- Need to do more



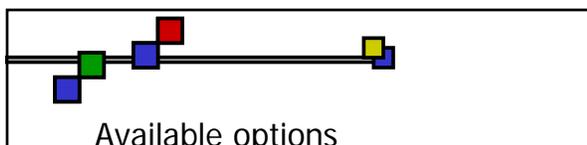
## Upcoming challenges

- Increase in consumer demands for better quality and food safety
- Changing demands from packers
- Producers more concerned about health and other issues
- Very difficult for small breeders and producers to compete
- Number of breeders on the decline



## Available Options

- Keep the status quo
- Invest heavily in molecular research and stop quantitative selection
- Use a balanced approach

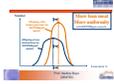


## Available options

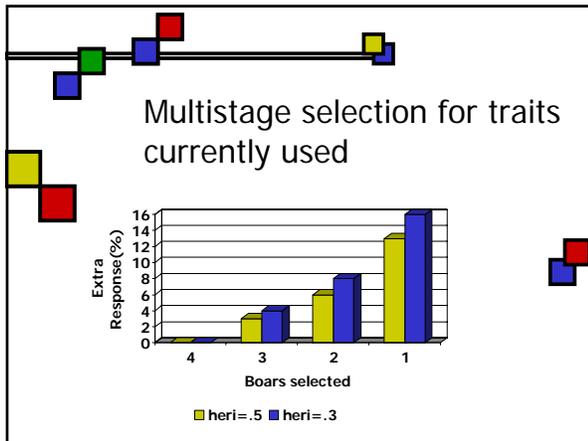
- A number of genes and markers
- Located on almost every chromosome
- Some of them have relatively large effect on traits of economic importance
- Useful for early stage selection
- Methods to use them



## Effect of IGF2 gene



	IGF2 +/+ Lean type	IGF2 +/- Intermediate	IGF2 -/- Fat type
N	160	67	29
Backfat (mm)	14.2	17.0	21.4
Lean depth (mm)	65.8	61.3	58.4
Loin eye area (sq cm)	50.5	46.1	43.3
Marbling (NPPC)	2.0	1.8	1.8
Minolta (L)	48.5	47.1	45.9
Drip loss (%)	2.4	2.2	2.3



- ### New discoveries
- More and more genes and markers are discovered in labs around the world
  - Selection on candidate genes leads to quick fixation
    - e.g. Halothane, RN
  - Then another gene is required

- ### Genome wide markers
- SNP genotyping being used widely
  - High throughput and cost reduction
  - Used for traceability
  - Used for creating dense marker maps
  - Can be useful for selection

- ### A balanced approach
- Test potentially useful genes and markers under Canadian conditions
  - Develop methods and selection programs
  - Continue research on search for better genes and markers
  - Keep track of advancement of gene mapping and new discoveries
  - Develop infrastructure and resources for further research and development

- ### Steps required
- Start collecting and storing DNA samples
  - Link molecular information and performance records
  - Make better use of available molecular information

- ### Existing DNA Banks
- DNA bank in Japan (since 1994)
  - DNA bank in France (since 1999)
  - DNA bank in US NSR (since 2002)
  - Others in China and companies like PIC
  - We should have one in Canada

## Potential uses

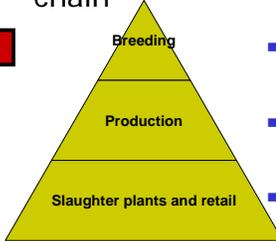


Infrastructure for many uses

- Gene mapping research
- DNA tests for promising genes
- Reference for
  - parentage test,
  - purity tests, and
  - traceability tests
- Future selection programs
- Allows making up missed opportunities and taking the advantage of the future discovery

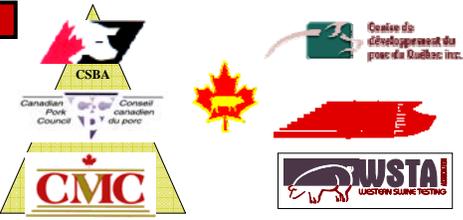


## Uses along the pork value chain



- Marker Assisted Selection, gene introgression
- Screening and sorting, uniformity and sex differentiation
- Quality control and traceability

## Common vision



Atlantic Swine Centre

CSBA  
Canadian Pork Council / Conseil canadien du porc

CMC

Centre de développement du porc de Québec inc.

WSTA  
WESTERN SWINE TESTING

## Thank you

