

Genetic Challenges of the Future –

A brief personal perspective

Archie C. Clutter
Newsham Choice Genetics

Some of our greatest challenges –

Maximizing Multiple Outputs from Our Genetic Lines



An example –
Maternal Lines contributing to Parent Stock Females

- 30 pigs weaned/sow/year
 - How soon can you get it to me?
- Transmitting maximum lean gain at lowest cost
- An evolving production environment



Holm et al., 2004 –

**Genetic correlation between Days to 100 kg and
NBA1 and NBA2 = 0.60 and 0.42, respectively**

Some of our greatest challenges –



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Data, Data.....More Data

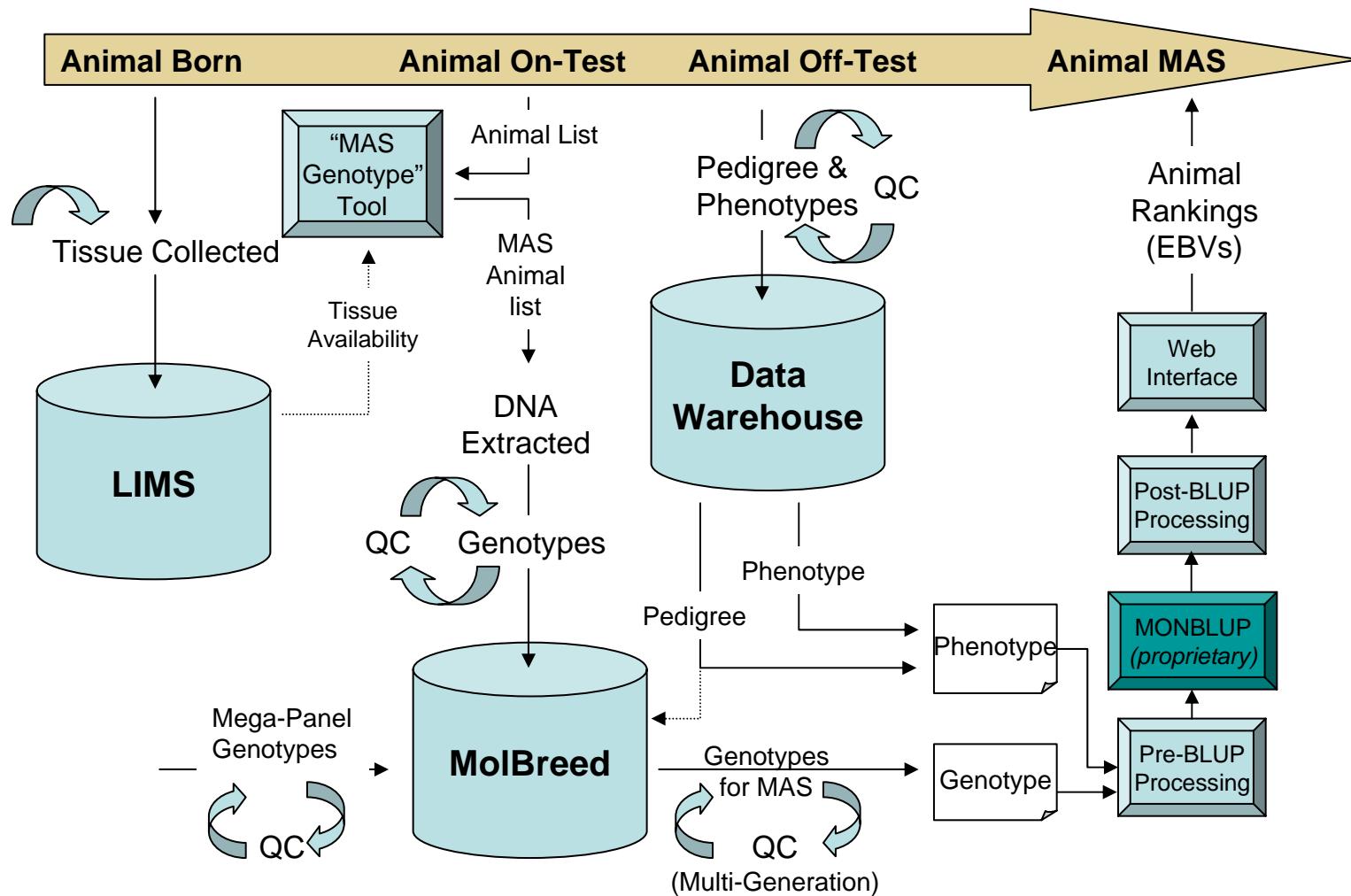
- New phenotypes
- New “SNP Chip”
- DNA sequence assembly
- ‘Routine’ MAS with an increasing number of markers

Consider a ‘small’ SNP60 Project:

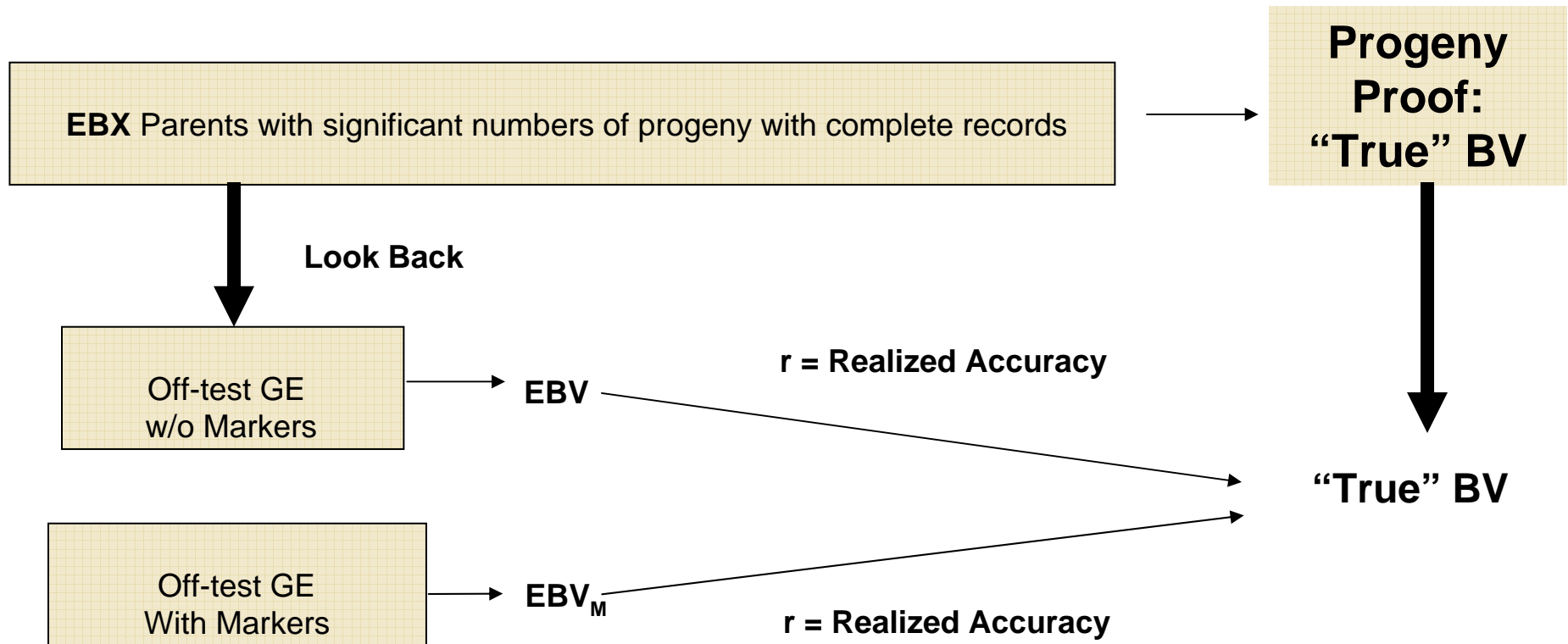
- 3,000 animals
- 55,000 SNP markers
- 165,000,000 genotypes

Successful Application of Genomics Takes Efficient Processes

- *The Critical Timing of Information Flow*



Ensuring Data and Technology add Value: *How can we measure marker impact?*



Methods –

- Completed genotyping of some additional (historical) parents with ranking set of SNPs
- N = 663 parents with at least 15 progeny with phenotypic records

Results –

- ~10% greater accuracy of predicting progeny proof when using markers

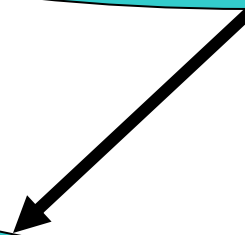
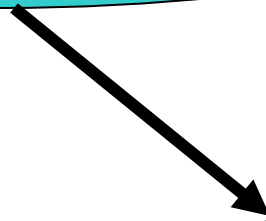
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Adequate People Resources



**Senior Scientist
Statistical Geneticist - Marker-Assisted Breeding**

COMPANY: NEWSHAM CHOICE GENETICS – Research and Development

LOCATION: ST. LOUIS, MISSOURI, or WEST DES MOINES, IOWA, USA

Position Available: Immediately

Newsham Choice Genetics is a customer-focused leading provider of high performance, high health swine genetics to the international pork industry. We are seeking an individual to help build a research program within our Team aimed at development and implementation of the next generation of **practical methods** for use of dense-marker data in marker-assisted breeding of pigs. The successful candidate will have the opportunity to leverage dense-marker data and extensive phenotypic databases that exist for Newsham Choice Genetics populations, and **provide leadership in developing strategies** for future genotyping and discovery projects. This position will interact with expertise within the group in quantitative genetics and animal breeding, molecular biology and gene mapping, and routine maintenance of existing platforms for marker-assisted genetic evaluation, and will help identify new supporting positions to achieve deliverables of the research program. The successful candidate will also **leverage existing and new collaborations** of Newsham Choice Genetics with leading public research groups in marker-assisted breeding, and will be encouraged to develop a strong record of peer-reviewed publications in the area. The Newsham Choice Genetics Research and Development Team has personnel in both West Des Moines, IA and the St. Louis Metro Area, and either of those centers are available as a base for this position.

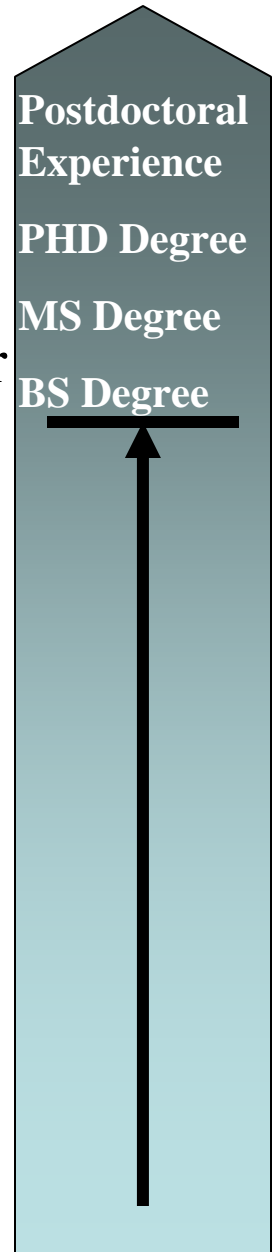
Qualifications:

The position requires a Ph.D. degree in Quantitative Genetics or a closely related field. Previous experience in animal or plant breeding is preferred. **The successful candidate must have extensive knowledge of current statistical methods for genetic evaluation and marker-assisted breeding in animal populations, including genome-wide selection. Knowledge and experience in a Linux- or Unix-based computing environment and current computing languages (C++, PERL) are highly desired. Knowledge of Bayesian statistics in marker-assisted breeding applications is advantageous.** The candidate must have **excellent communication skills and the ability to work effectively in research teams.**

'Adequate' People Resources

- Clearly envision value creation/capture from technology application
- Understand implications of new technology for components of animal/food production systems
- Effectively use fundamental knowledge and new technology to solve complex problems
- Ability to quickly grasp emerging technologies

Requisite Threshold of Factual Knowledge



GOAL

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Expecting more of our animals

Data, Data.....More Data

Expecting more of our people

Adequate People Resources



An overriding challenge facing
the industry:

Reconciliation of Meat Production
in an increasingly
Anthropomorphic Culture

NOT MY HOUSE