

# The PorcineSNP60 Success Story

## August 31, 2011

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Illumina



### What You Should Expect to Learn in the Next 20 Minutes

- ▶ A bit about Illumina, the science and the technology
- ▶ How we recognized the opportunity
- ▶ How we seized the opportunity
- ▶ Applications for the product
- ▶ Extension of the concept

## We are a Global Organization

*Expanded Commercial, Manufacturing, R&D, Sales, Service & Support*



3

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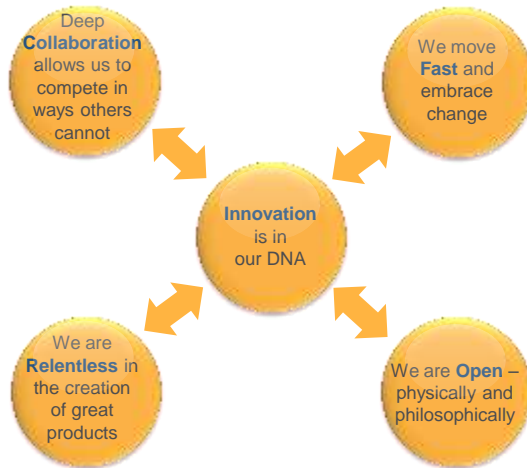
## Illumina's Values



4

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## illumina's Values

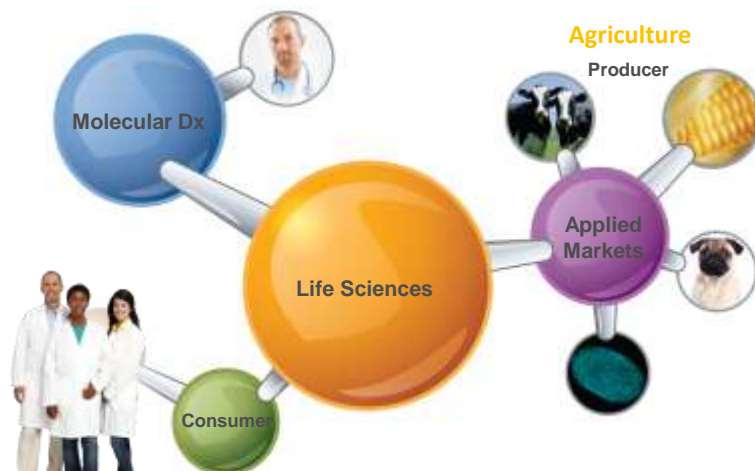


5

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## Agriculture Is Critical to illumina's Mission

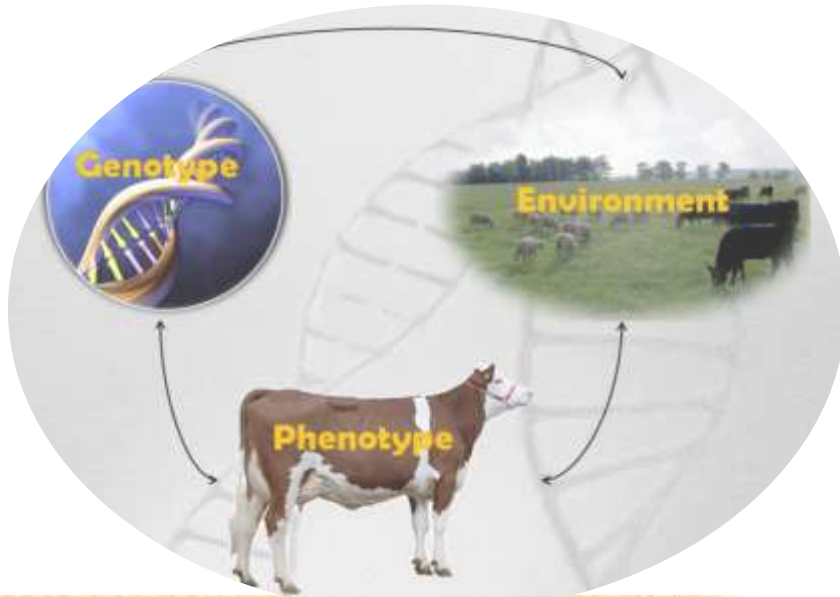
*Innovating Future Genomic Analysis*



6

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# Genotype. Environment. Phenotype.

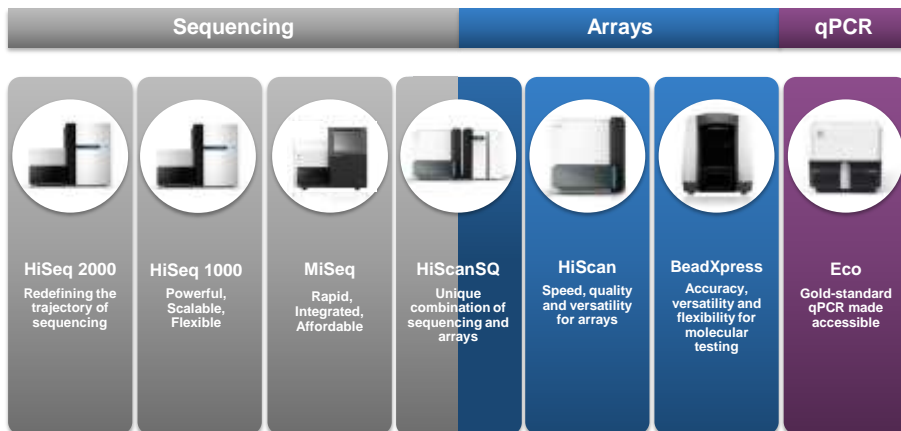


7

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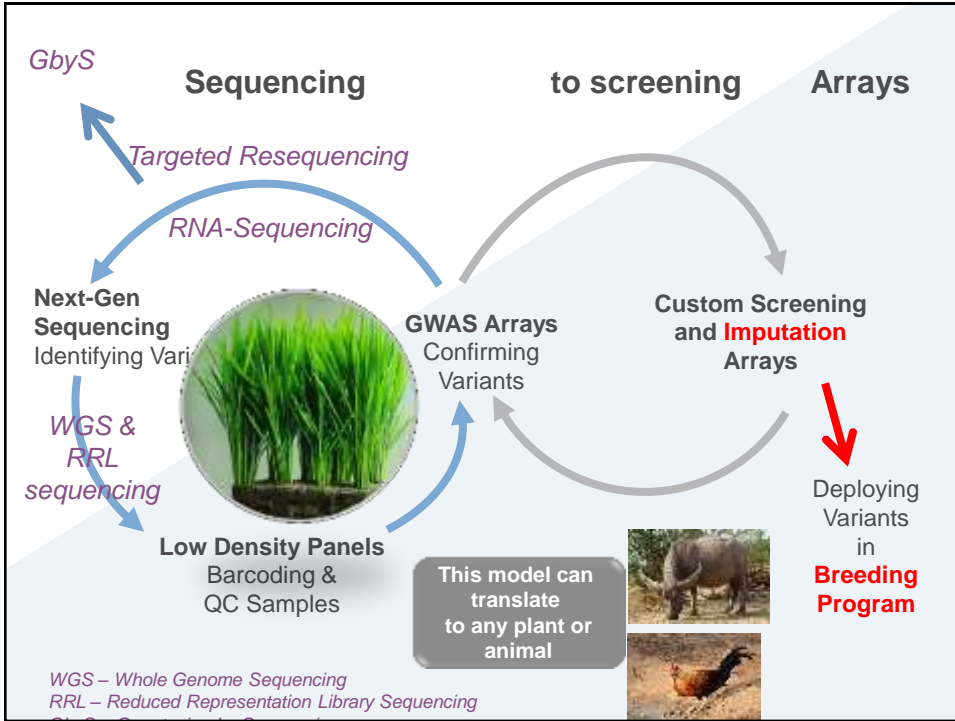
## Illumina Portfolio Overview – **iNNOVATION** is in our DNA

From Genome-Wide Discovery to Targeted Validation and Screening



8

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### Traditional versus Current Breeding Methods

10

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## The Economic Benefit of Genomic Selection

### ▶ Goals:

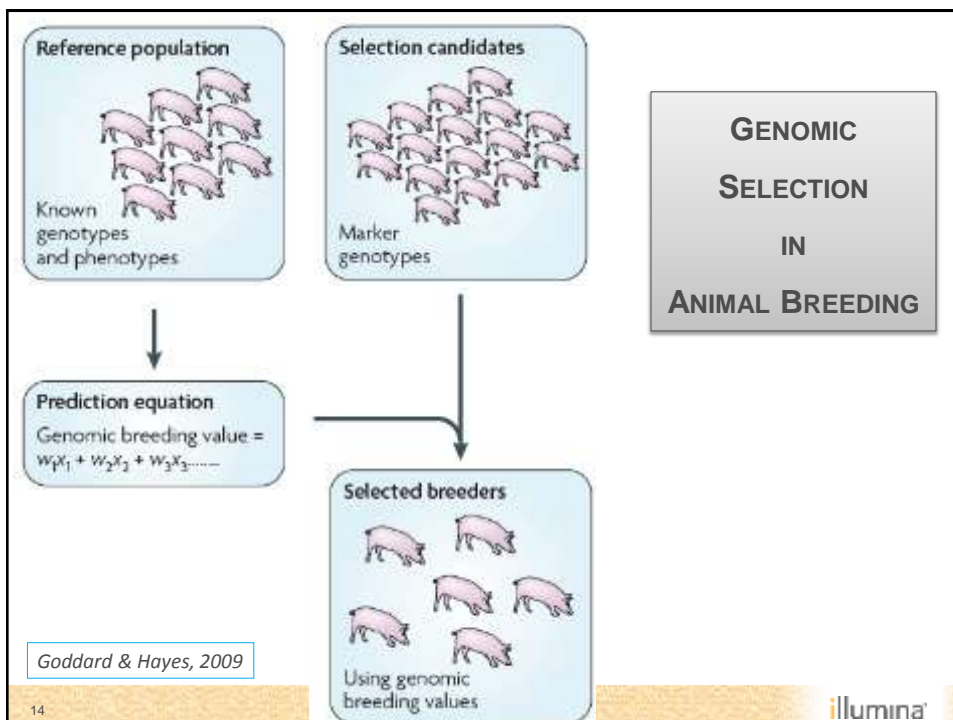
- More pigs weaned per litter
- Muscling
- Leanness
- Higher carcass weight
- More feed efficiency
- Faster growth rate
- Greater disease resistance

### ▶ Consumers:

- Seedstock producers
- Breed associations
- AI companies

13

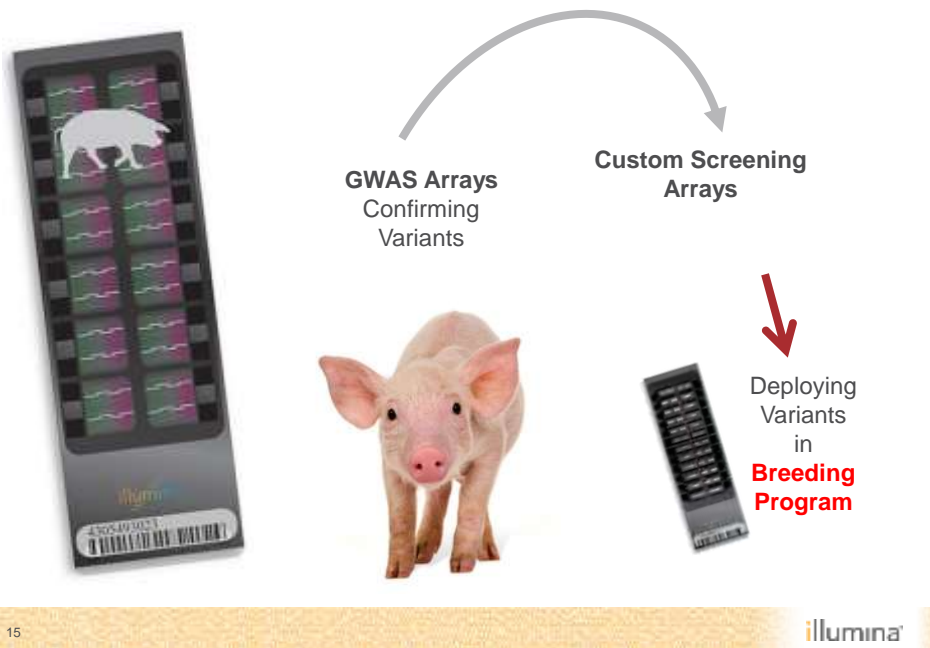
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14

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## PorcineSNP60 Project

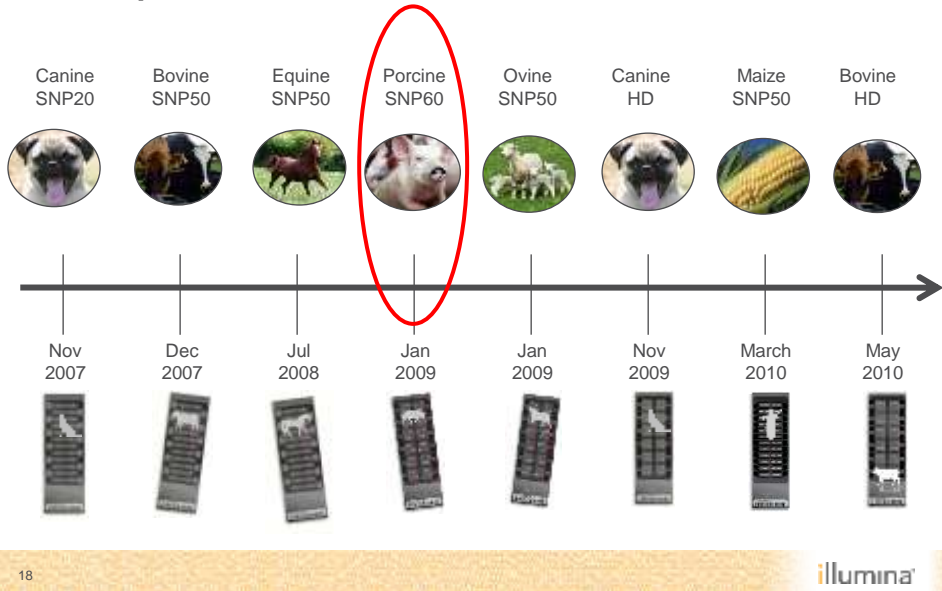


“The accuracy of the currently available BLUP breeding value at the time of selection is well under 50 per cent. If this can be increased to 70 per cent by using an SNP-based breeding value, genetic progress for such traits can be improved by 40 per cent. Our results in pigs are convincing us that we can significantly increase genetic progress by the use of this novel technology. We expect to select our breeding candidates in the future using this new method.”

Dr. Patrick K. Charagu  
Lead, North American Technical Services  
Hypor, Inc.

**Gene Technology Revolutionizing Swine Breeding**  
January 18, 2010

## illumina Has Extensive Experience with Consortia-Developed **Commercial** Products

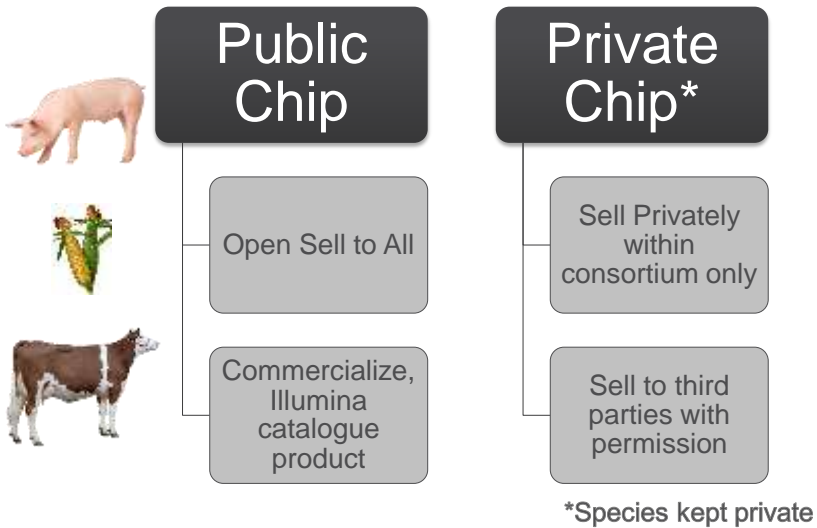


## What is an Ag Consortium?



- ▶ A group of people or organizations with a common interest in advancing the collective understanding of the genetics of an agriculturally important species.
- ▶ The consortium members actively work together – scientifically and often financially – to enable actions that promote that interest.

## Consortium Path Options



20

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## Economies of Scale Drive Research

	Early Access Pricing		
	Tier A	Tier B	Tier C
<b>PorcineSNP60 Array</b>			
Number of samples	11,520+	25,056+	42,624+
Price per Sample (USD)	\$175	\$120	\$99

21

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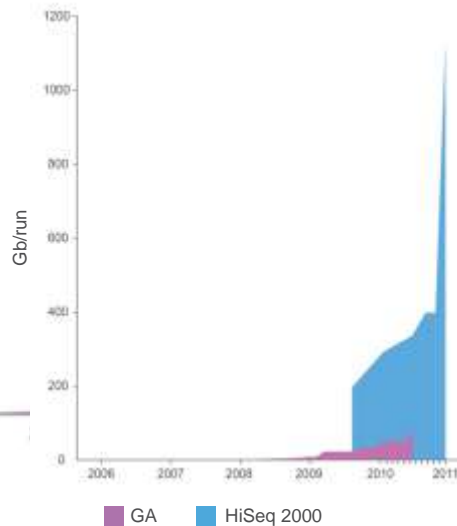
## Evolution of Instrument Performance Has Resulted in an Explosion in Output Per Run ...

From <1Gb to >1Tb in 4 Years

Internally we have completed multiple runs generating >1Tb of data per run

Greater than 80Gb per day!  
Greater than 7.5B PE reads!

Sequencing Run Parameters	
Run format: 2x150 bp	
Output full run	1.13Tb
Output per day	81Gb
Data passing filter	
88.9%	



22

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## ...and is Enabling an AgriGenomics Revolution

- ▶ Apple
- ▶ Artichoke
- ▶ Banana
- ▶ Barley
- ▶ Cacao
- ▶ Chickpea
- ▶ Coffee
- ▶ Cotton
- ▶ Cucumber
- ▶ Eucalyptus
- ▶ Maize
- ▶ Millet
- ▶ Papaya
- ▶ Peach
- ▶ Pigeonpea
- ▶ Pine
- ▶ Plum
- ▶ Poplar
- ▶ Raspberry
- ▶ Rice
- ▶ Sorghum
- ▶ Soybean
- ▶ Strawberry



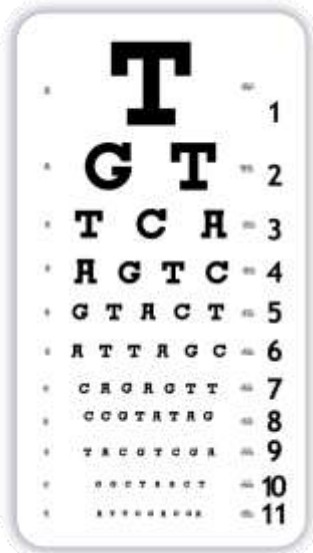
- ▶ Sugar Beet
- ▶ Switchgrass
- ▶ Tobacco
- ▶ Tomato
- ▶ Turfgrass
- ▶ Watermelon
- ▶ Wheat
- ▶ Bluefin Tuna
- ▶ Catfish
- ▶ Chicken
- ▶ Cow
- ▶ Dog
- ▶ Horse
- ▶ Oyster
- ▶ Partridge & Quail
- ▶ Pig
- ▶ Rainbow Trout
- ▶ Salmon
- ▶ Sheep
- ▶ Turkey
- ▶ White Shrimp
- ▶ Tasmanian Devil

▶ And MORE

23

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## 20/20 Vision



24

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## 2020 Ag Predictions\*

- ▶ Genomic selection will surpass conventional methods as the dominant breeding paradigm
- ▶ Economic values will be associated with specific haplotypes
- ▶ Selection programs will be driven primarily by array data due to superior economics
- ▶ All economically impactful agricultural species, subspecies and their pathogens will be sequenced
- ▶ Animal pharmacogenomics, metagenomics and epigenetic analysis will be routine
- ▶ Tens of thousands of related genomes will be sequenced to understand genetic diversity within and between germplasm pools
- ▶ Labeling using genetics will be a marketing tool for accuracy, tracking like an RFID, for product quality, enhanced benefits, absence of allergens, etc.



\* Opinions expressed in this slide are just that – opinions. They do not represent a guarantee, nor do they represent the opinions of the Company as a whole, but rather just a group of people who were together talking once and kept a record.

25

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"That's  
all  
folks!"



Extensive toolset. Proven technology.  
Collaborative approach,