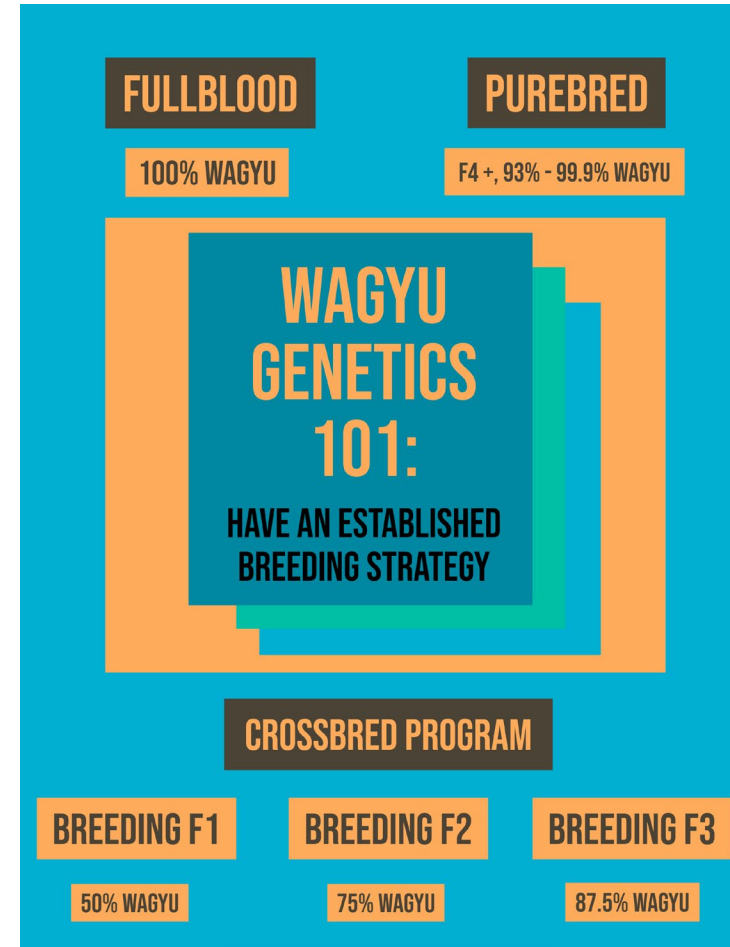


Strategies for Managing Breeding and Genetics Programs

- Presented by: Mitchell Ruth

1st: Establish a Breeding Strategy

- **Crossbred Program:** F1 (50% Wagyu), F2 (75% Wagyu), F3 (87.5% Wagyu)
- **Purebred Program:** F4+ (93% - 99.9% Wagyu)
- **Fullblood Program:** 100% Fullblood Wagyu
- **A combination of two or more**



Establishing a **Breeding Strategy**: What should I consider?

- **Current Resources:**
Cattle, land, feed, infrastructure, etc.
- **Your Goals & Strengths:**
i.e. Produce premium beef, strong cattle management team, etc.
- **End/Target Market:**
Target marble score, price point, who is your buyer?, etc.



The image is a promotional graphic for Wagyu beef. It features a dark grey background on the left and a photograph of Wagyu beef cuts on a wooden cutting board on the right. The text 'WAGYU' is written in white, with a white silhouette of a cow above it. Below this, the text 'The Ultimate Carcass Breed' is written in white. The graphic is divided into four green quadrants, each containing an icon and text: a dollar sign for 'Increased Profit', a cow silhouette for 'Functional Cattle', a marbled beef cut for 'Amazing Marbled Beef', and a DNA helix for 'Superior Carcass Genetics'. At the bottom, the website 'WWW.INTERNATIONALWAGYUBREEDER.COM' is written in green.

WAGYU
The Ultimate Carcass Breed

Increased Profit

Functional Cattle

Amazing Marbled Beef

Superior Carcass Genetics

WWW.INTERNATIONALWAGYUBREEDER.COM

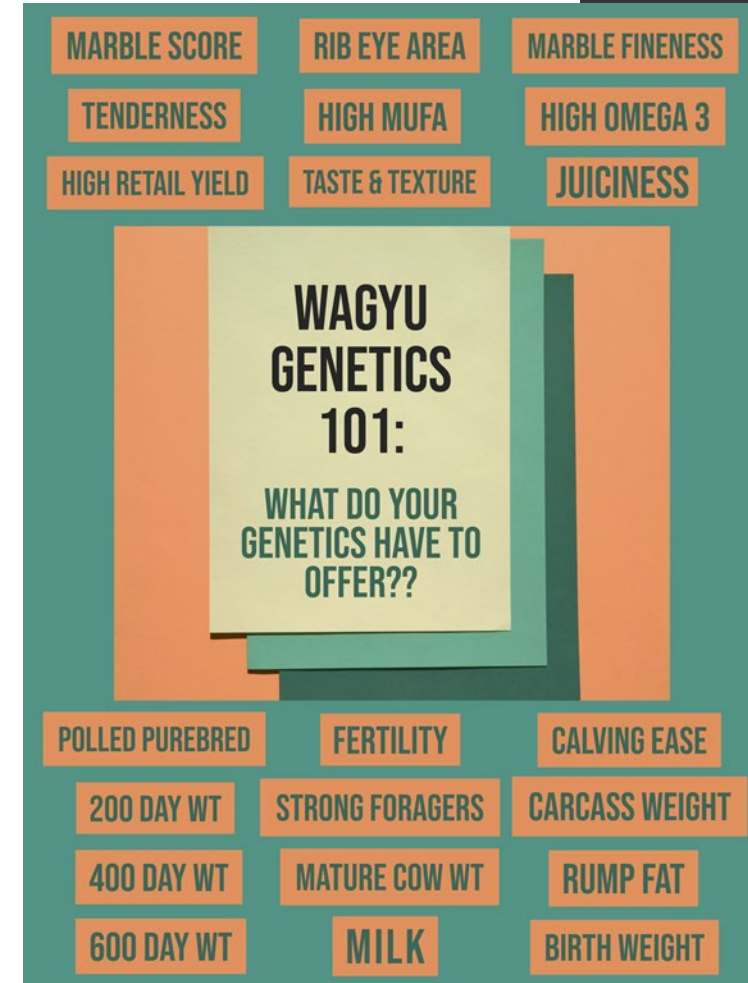
Reproduction Programs & their Value/Importance

- A repro program is an established plan to get cows and heifers pregnant as efficiently as possible.
- An example would be doing 1 round of timed AI then turning out clean up bulls to breed those that return to heat.
- Many different Synchronization Protocols available: CIDR Synch, Ovsynch, etc.
 - Key is to find one that works for your management program



Reproduction Programs: Why?

- Cows need to get pregnant to be profitable
- So, optimizing the time to breed back and pregnancy is crucial
 - Especially in seasonal calving herds
- Timed AI, allows the use of AI more efficiently than natural heats
- Why use AI?
 - Top Genetics, consistency, corrective mating, increase genetic progress, increase individual animal value, increase average carcass value
- Choose a Timed AI synch program that works for you
 - Consider: # handlings, when they will be bred, cost of the program, target conception rate, etc.



Why Use **Proven** Genetics??

- **First What is Proven?**
 - **Gold Standard:** Performance recorded data, Objective 3rd Party Carcass Data, Breedplan data backed proof, etc.
 - **Next:** inhouse performance & carcass data
 - **Last:** Opinion – i.e. “I killed some and they looked great”
- **Consistency & Reliability of Outcomes:**
 - Risk management
 - In reality a son is rarely better than his sire/father!
 - Need a saleable carcass



Why Use **Proven** Genetics??

- **In reality a son is rarely better than his sire/father!**
 - Following is the effort that it takes to breed a top Holstein bull:
 - There are **10,000,000** Holstein cows in the USA
 - Of these **4,000,000** are milk fat and protein recorded
 - Of these **827,500** are registered
 - Of these **8,275** are elite cows (top 1%)
 - Of these **3,200** are classified as V.G. 85 or better (type assessment)
 - Of these **1,600** have V.G. maternal sire and V.G. dams
 - From these, **600** sons enter AI centres
 - After proving their daughters in a minimum of **30 herds** and **70 daughters** and minimum **reliability of 75%**
 - The top 10% return to service = **60 bulls** for use in USA herds
 - 1% or **6 bulls** become elite sires to sire the next generation
 - It takes a **minimum of 6 years** from selection to a proven sire
- How hard do you think it is to breed a genetically superior Wagyu bull?

Source:

<http://blackmorewagyu.com/commercial-wagyu-farming>

“Cheap” or **Inferior** Genetics

- **“Don’t be fooled by Cheap or Inferior Genetics, they will have long lasting effects in your herd.”** – Scott de Bruin 2018 AUS Wagyu Edge Presentation
- **Long Lasting Effects:**
 - Their Steers – 3yrs+ from conception to harvest
 - Their Daughters – Replacements: 3yrs+ from conception until calving
 - Their Daughters Daughter’s – 5 yrs + if retained for breeding
- **Directly Impact Profitability:** Limit the Potential Performance of Animals



You own this!

♥

🕒

📍

Genetic improvement, measured

- Importance of genetic improvement of female lines
- Improvement in cow herd
- HSCW lifted by 7.1%
- EMA at 10/11th rib increased by 7.4%
- Ausmeat ave marble score increased by 17%
- **Age at Slaughter reduced by 24%**

Cow Year Prefix	Z	A	B	C	D	E	F	G	H
AVE HSCW	406	407.19	410	415	412.6	418	420.75	437.4	435
AVE EMA	94.45	93.56	93.79	92.92	94.62	96.34	98.39	100.45	101.43
AVE MS	7.45	7.88	7.75	7.77	8.07	8.05	7.75	8.28	8.73

Excellence without Compromise



Importance of the **Female** in Breeding

- Female contributes half the DNA, just like the sire
- **Often overlooked** in carcass results & data evaluation
 - i.e. Itomichi ½ x Mayura Itoshigenami JNR steers will likely perform far better than Itomichi ½ x World K's Haruki 2 steers
 - May skew your perspective on how good Itomichi ½ is, Why EBVs are so valuable
- Mitochondrial DNA inheritance only coming from the dam
 - https://www.ajas.info/upload/pdf/17_243.pdf
- Cytoplasmic inheritance theories
 - <https://www.sciencedirect.com/science/article/pii/S0022030286807731>
- Epigenetics triggered in utero by the dam
 - <https://epigeneticsandchromatin.biomedcentral.com/articles/10.1186/s13072-016-0081-5>



Common Mating Decision Strategies

- **Random Mating:** Turn bulls out breed anyone, no rhyme or reason
- Mating based on inbreeding coefficient
- **Corrective Mating:**
 - Dairy – i.e. mating services
- **Linebreeding:** Consolidation of desirable traits
- **Blanket AI or Natural Service:** One sire on all cows
- **Terminal Mating:**
 - Sexed male semen
 - Carcass traits emphasized
 - No consideration to maternal traits, etc.
- **Replacement AI:**
 - Sexed female semen –
 - Focused on key replacement heifer traits
 - Less consideration to carcass traits











Understanding Genetic Tests vs Genomics Tests

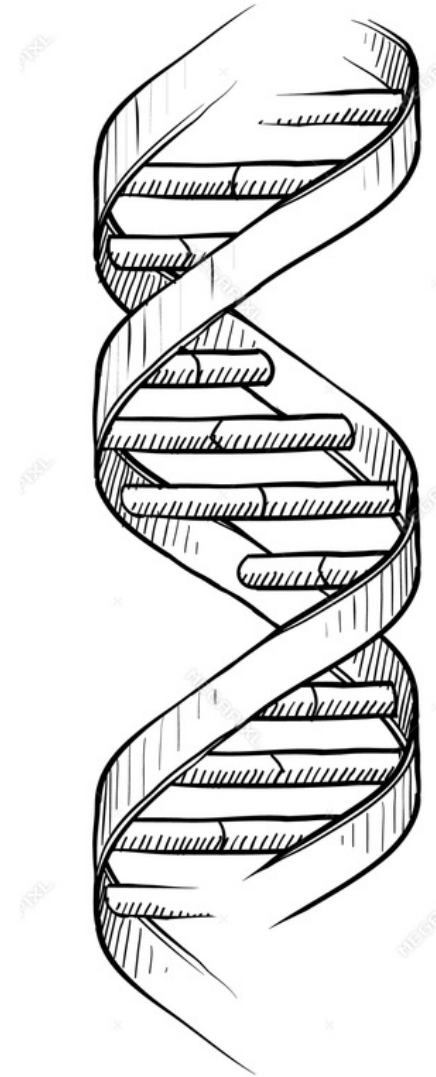
- There is a large difference!
- **Genetics Tests:** Generally simple, single trait tests
 - SCD
 - Tenderness
 - Recessives
 - Exon 5
- **Genomic Tests:**
 - Aus Breedplan Genomics: 50K SNP Genomics
 - Others developing inhouse genomics:
 - Blackmore
 - AACo



Understanding **Genomics Tests**

- **Genomic Tests:**

- Complex genetic evaluation using Single Nucleotide Polymorphism (SNP) technology
- Study of DNA and genomes with regard to structure, function, evolution, and mapping. It looks at specific sets of genes and genetic material found in an animal's DNA to make predictions of an animal's future performance and potential for a variety of traits
- Relies heavily on phenotype evaluation, performance data, and carcass data of past sires, dams, steers, and heifers
- Genomes can be assessed for various traits related to calving ease, weaning weight, carcass weight, marbling, type traits, repro traits, health traits, etc.
 - If you have the data...



Proper Strategies for Utilizing Genomics:

- **Whole Herd:**
 - Identify the top and bottom of the herd
 - Donors & Recipients
- **Within Herd:**
 - Individual Selection & Decision Making
 - Comparison of Siblings & Flush mates
 - Identify Individual Strengths/Weaknesses
- **National/International Level:**
 - Top Sire Selection
 - Top Females Selectin
 - Buy or Acquire new or complimentary genetics





The **Danger** of Breeding with Indexes, Single Traits, Etc.

- **Potential Loss of Traits**
 - Example: Holstein Dairy Cattle
- **Potential to Amplify Weaknesses**
 - Example: Guernsey Dairy Cattle
- **No Corrective Mating**
- **Inbreeding not controlled**



Donor Selection

A black cow is standing in a grassy field, facing right. The background shows trees and a clear sky. The cow is the central focus of the image, and the text is overlaid on it.

- **What Should I Consider?**
 - Carcass Data (if available)
 - Genomics
 - Pedigree
 - Phenotype
 - Genotype (recessives, SCD, etc.)

Mating My Donors

- What Should I Consider?
 - **Carcass Data** (if available): Strengths, Weaknesses
 - **Genomics**: Weaknesses, Strengths
 - **Pedigree**: Inbreeding, Complimentary genetics, Linebreeding
 - **Phenotype**: Strength, Faults/Corrections needed
 - **Genotype**: Recessives, Exon 5, SCD, etc.
- Sire Factors:
 - **Price**
 - **Availability**
 - **Reliability**
 - Above factors



Mayura L0010



World K's Michifuku



TF Itohana 2

Strengths & Weaknesses of Breedplan

Strengths

- World-leading EBV & GEBV system
- Very Flexible – opportunity to develop EBVs for desired traits
- High reliability of major traits

Weaknesses

- Missing Some Key Carcass Points: P8 Fat, Rump Fat, FC, Etc.
- No Type Trait EBVs: Stature, Strength, Feet & Legs,
- No Health Trait EBVs: Productive Life, Conception & Preg Rates, Livability, etc.



7H012266 Yoder

Woodcrest Mogul Yoder-ET (EX-90-GM)
 HOUSA72254526 100% RHA-NA
 TR TP TC TV TL TY TD
 Born: 1/5/13
 aAa: 432516 DMS: 456,561
 Breeder: Woodcrest Dairy LLC, Lisbon, NY
 Beta-Casein: A2A2 GFI: 9.4% StrataGEN: Red
 Kappa-Casein: AB Beta-Lactoglobulin: BB
 Haplotypes: HH1T HH2T HH3T HH4T HH5T HH6T

PEDIGREE

Sire: Mountfield Ssi Dcy Mogul-ET (EX-93-GM)
 Dam: Woodcrest Planet Yakara-ET (VG-85-DOM)
 2-00 3X 365d 31,050M 3.6% 1,131F 3.4% 1,042P
 Dtr: Woodcrest Mogul Yall-ET (VG-86-VG-MS)
 2-00 2X 365d 31,680M 4.0% 1,260F 3.4% 1,075P
 Dtr: Woodcrest Defender Yamini (VG-88-EX-MS)
 3-10 3X 365d 31,550M 3.0% 946F 3.1% 970P
 MGS: Ensenada Taboo Planet-ET (EX-92-GM)
 MGD: Coyne-Farms Bkeye Yvonne-ET (VG-88-VG-MS-DOM)
 3-05 3X 343d 33,300M 3.7% 1,242F 3.2% 1,053P
 Dtr: Woodcrest Planet Yakara-ET (VG-85-DOM)
 2-00 3X 365d 31,050M 3.6% 1,131F 3.4% 1,042P
 Dtr: Woodcrest Planet Yak-ET (VG-85-VG-MS)
 3-01 3X 365d 36,790M 3.2% 1,190F 3.2% 1,186P
 Dtr: Woodcrest Planet Yup-ET (VG-85-VG-MS)
 3-01 3X 291d 29,960M 3.7% 1,103F 3.0% 907P
 MGGs: R-E-W Buckeye-ET (EX-90)
 MGGD: Coyne-Farms Finley Yarn-ET (VG-88-EX-MS-GMD-DOM)
 3-10 3X 365d 37,540M 3.3% 1,243F 3.4% 1,289P
 PGS: Coyne-Farms Dorcy-ET (VG-87)
 PGD: Mountfield Marsh Maxine-ET (VG-88-EX-MS-DOM)

SPECIAL DESIGNATIONS



Use on Dtrs. of: Bradnick, McCutchen, Midnight, Petrone, Punch

Production (PTA-lbs)		04/19 CDCB-S Gen. Eval.	
Milk	+1,079	99% R/9,653 D/1,106 H	
Protein	+50	% Protein	+0.06
Fat	+103	% Fat	+0.22
CFP	+153		
NM	+\$879	98% R	
CM	+\$907	FM	+\$817
GM	+\$839		

Type (PTA)		04/19 CDCB-S/HA Gen. Eval.	
GTPI	+2682	Age Adjusted Avg.	82.4
Type	+1.53	99% R/2,175 D/438 H	
UDC	+1.89	BWC	-0.63
FLC	+1.30	D	+0.84

Semen Fertility

Sire Conception Rate +2.2 99% R 46,010 Obs

Fitness

Somatic Cell Score	3.03	99% R	
Productive Life	+4.8	97% R	
Livability	+1.8	88% R	
Daughter Pregnancy Rate	+1.5	99% R	
Heifer Conception Rate	+3.8	98% R	9,654 Dtrs
Cow Conception Rate	+3.6	98% R	6,799 Dtrs
Fertility Index	+2.3	99% R	

Wellness

Metritis	+1.4	91% R	1,474 Dtrs
Ret. Placenta	+0.4	90% R	1,927 Dtrs
Disp. Abomasum	+0.7	89% R	1,483 Dtrs
Ketosis	+0.7	89% R	1,337 Dtrs
Mastitis	-4.1	95% R	1,555 Dtrs
Milk Fever	-0.1	79% R	1,070 Dtrs

Calving (% DBH)

Sire Calving Ease	5.9	99% R	22,790 Obs
Daughter Calving Ease	3.4	99% R	4,949 Dtrs
Sire Stillbirth (%SB)	5.7	99% R	20,080 Obs

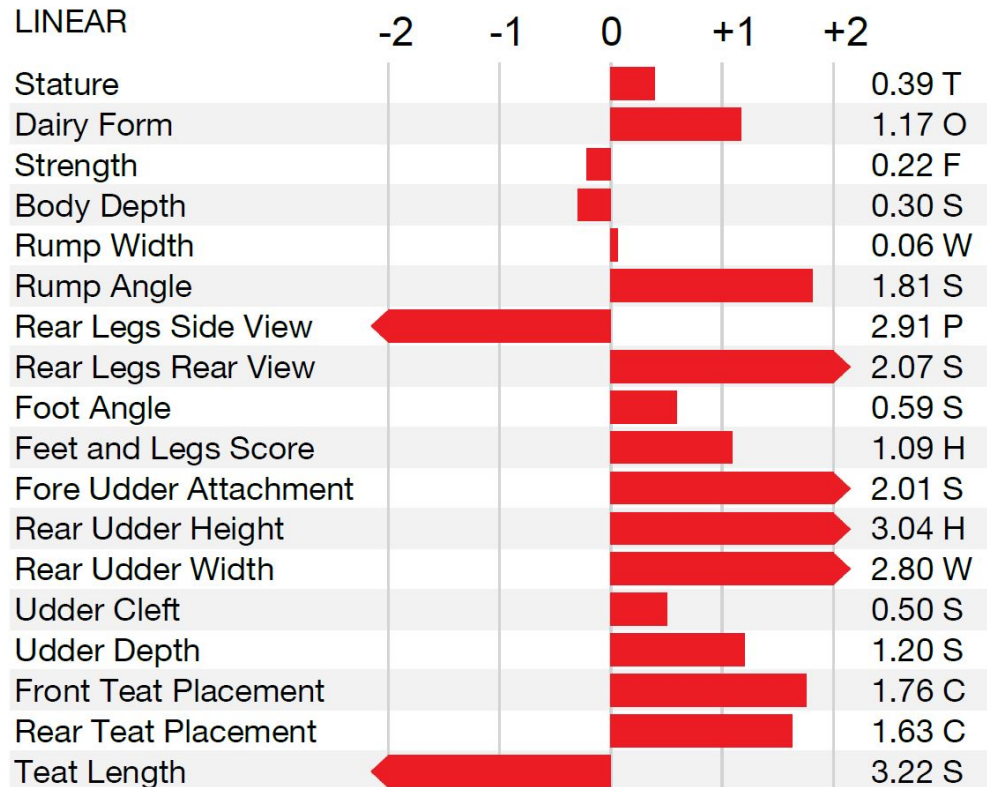
Reality of
 what is
 possible:

MGGD: Coyne-Farms Dorcy-ET (VG-88-EX-MS-GMD-DOM)
 3-10 3X 365d 37,540M 3.3% 1,243F 3.4% 1,289P
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SPECIAL DESIGNATIONS



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Calving

(% DBH)

Sire Calving Ease	5.9	99% R	22,790 Obs
Daughter Calving Ease	3.4	99% R	4,949 Dtrs
Sire Stillbirth (%SB)	5.7	99% R	20,080 Obs
Daughter Stillbirth	3.7	99% R	4,618 Dtrs
Sire Gestation Length	-0.5	99% R	12,659 Obs
Early First Calving	+1.0	97% R	4,159 Obs

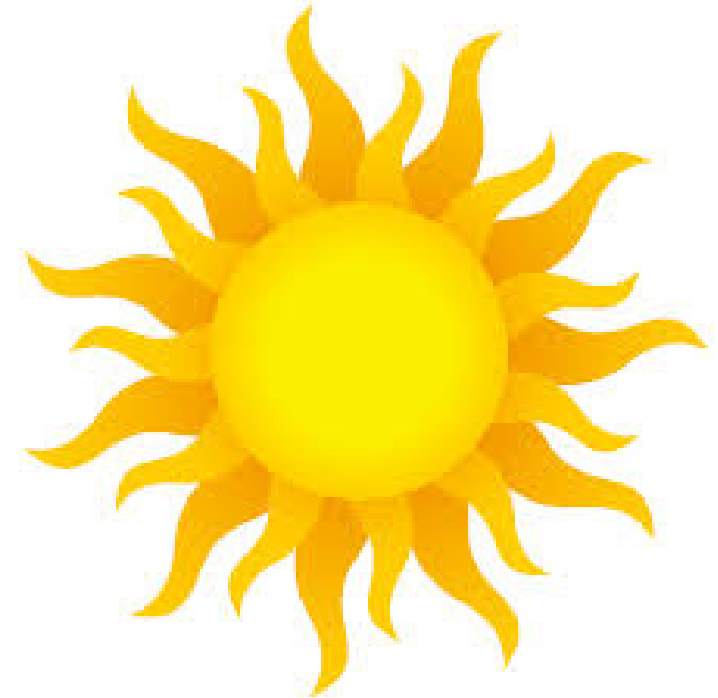
Zoetis Wellness

(STA) Eval Date: N/A Data Source: N/A

DWP\$	WT\$	CW\$	
+\$727	-\$173	+\$7	
Mastitis	81	94% R	368 Dtrs
Lameness	97	91% R	230 Dtrs
Disp. Abomasum	100	91% R	308 Dtrs
Ketosis	106	94% R	431 Dtrs
Metritis	108	94% R	492 Dtrs
Ret. Placenta	101	95% R	521 Dtrs
Calf Respiratory Disease	103	95% R	808 Dtrs
Calf Scours	106	96% R	783 Dtrs
Calf Livability	99	96% R	1,040 Dtrs

The Bright Future of Wagyu

- Increasing Global Demand for Premium Beef
- Increasing Buying Power of Global Middle Class
- Genomics/ GEBVs
 - Reducing DOF
 - Continued Progress in Carcass Traits
- Increased Availability of Elite Semen & Genetics
- Strong Diversity of Genetics
- EBVs Make Pedigree Reading Easier



Thank You & Questions?