Agriscience Quiz Objectives: by the end of this unit, students will be able to...

- Summarize the process by which modern breeds of livestock and other domesticated animals were created.
- Provide details on the cellular mechanisms that enable the formation of breeds of domesticated animals.
- List the two most important factors for why breeds emerged.
- Identify the key traits and describe each of the following: Holsteins, Jerseys, Brown Swiss, Ayrshires & Guernseys, Milking Shorthorn
- Identify the main purpose of breed associations and summarize how their data enables breeds to improve.
- Define and provide examples of each of the following: a) Mutation b. Random Drift c. Selection d. Crossbreeding e. Selection AND Crossbreeding
- Compare and contrast continuous and discontinuous traits, and explain how these differences affect breeding
  predictability.
- Define each of the following: a. Bell curve b. Heritability c. Environmental Variance d. Outlier e. Correlation
- Explain how heritability values are used to inform breeding decisions in agriculture.
- Explain the difference between negative correlation and positive correlation and connect these differences to breeding decisions in agriculture.
- Summarize the meaning of Galton's Law and explain how this would affect breeding practices.
- Define each of the following and explain their importance to breeding decisions: a. Sire Summary b. Predicted Transmitting Ability c. Standard Transmitting Ability d. Art. Insemination
- Use a sire summary report, PTA scores, and STA scores to make sire selections appropriate to the needs of a herd and the heritability of the affected traits.

R-E-W BUCK							PI +1896	Destate	10.70	10.07				-	- 1		1
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re: MARA-THON BW MARSHALL-ET						+1701M	Fat Final Score		tiah tiah								
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		20 H			+1.5	SCE 6%	69 %R	R Legs-Side View									
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CAN 682056 Bire: MAUGHL	EPTEMBER 54 100%RHA-N IN STORM-ET 100%RHA-N	STORI NA RCT A B/R	V TL TV TL	09	0.252.00		BUCKEYE PI +1580N	Teat Length A Protein Fat	0.25 3 0.46 2.43 3.30 0.78	Hiah Hiah Hiah High			and conserved				
CAN 682056 Sire: MAUGHL CAN 5457798	EPTEMBER 64 100%RHA-1 IN STORM-ET 100%RHA-N RUMMOND SH	STORI NA RCT A B/R	V TL TV TL	09	0.252.00		BÚCKEYE PI +1580N +1463M	Teat Length A Protein Fat Final Score	0.25 \$ 0.46 2.43 3.30 0.78 2.46	Short							
CAN 682056 CAN 682056 Sire: MAUGHL CAN 5457798 Dam: GLEN DR CAN 6185591	EPTEMBER 54 100%RHA-I JN STORM-ET 100%RHA-N 3UMMOND SH 100%RHA-N	STORI NA RCT A B/R	VTL TVTL T		G	ΞM	BÚCKEYE PI +1580N +1463M +1210C	Teat Length Protein Fat Final Score Productive Life <u>Somatic Cell Score</u> Stature	0.25 \$ 0.46 2.43 3.30 0.78 2.46 2.73	Hiah Hiah Hiah High							
ONTROLLER SEME CAN 682056 Sire: MAUGHL CAN 5457798 Dam: GLEN DR CAN 6185591 MACE PRODUC	EPTEMBER 54 100%RHA-1 IN STORM-ET 100%RHA-N RUMMOND SH 100%RHA-N CTION	STORI NA RCT A B/R	VTL IVTL I %R	SIRE	DAM	GM DAU	BÚCKEYE PI +1580N +1463M +1210C GRP	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength	0.25 \$ 0.46 2.43 3.30 0.78 2.46 2.73 1.59	High High High High Low Tall Strong							
CAN 682056 ire: MAUGHL CAN 5457798 iam: GLEN DR CAN 6185591 IACE PRODUC Milk	EPTEMBER 54 100%RHA-I JN STORM-ET 100%RHA-N 3UMMOND SH 100%RHA-N	STORI NA RCT A B/R IMMER-E A RC	VTL TVTL T	SIRE +245	G	GM DAU 25704	BÚCKEYE PI +1580N +1463M +1210C GRP 25258	Protein Fat Final Score Productive Life <u>Somatic Cell Score</u> Stature Strength Body Depth	0.25 \$ 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78	High High High Low Tall Strong Deep							
ONTROLLER SEME CAN 682056 Sire: MAUGHL CAN 5457798 Dam: GLEN DR CAN 6185591 MACE PRODUC	EPTEMBER 54 100%RHA-1 IN STORM-ET 100%RHA-N RUMMOND SH 100%RHA-N CTION	STORI NA RCT A B/R IMMER-E A RC	VTL IVTL I %R	SIRE	DAM	GM DAU 25704 991	BÚCKEYE PI +1580N +1463M +1210C GRP 25258 936	Protein Fat Final Score Productive Life <u>Somatic Cell Score</u> Stature Strength Body Depth Dairy Form	0.25 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36	High High High Low Tail Strong Deep Open Rib							
URSUIT SE CAN 682056 ire: MAUGHL CAN 5457798 am: GLEN DF CAN 6185591 IACE PRODUC Milk Fat Pro	EPTEMBER 54 100%RHA-1 IN STORM-ET 100%RHA-N RUMMOND SH 100%RHA-N CTION + 433 + 56 + 9	STORI NA RCT A B/R IMMER-E A RC % +.16 01	V TL TV TL T %R 95	SIRE +245	0 DAM -455	5M DAU 25704 991 767	BÚCKEYE PI +1580N +1463M +1210C GRP 25258 936 758	Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle	0.25 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44	High High High Low Tall Strong Deep							
CAN 682056 ire: MAUGHL CAN 5457798 iam: GLEN DF CAN 6185591 IACE PRODUC Milk Fat Pro 05-2006	EPTEMBER 54 100%RHA-I IN STORM-ET 100%RHA-N RUMMOND SH 100%RHA-N CTION +433 +56 +9 577 DAUS	STORI NA RCT A B/R IMMER-E A RC % +.16 01	V TL TV TL F 95 HERDS	<b>SIRE</b> +245 +40 +8	<b>DAM</b> -455 +17 -13	5M 25704 991 767 56 %RIP	BUCKEYE PI +1580N +1463M +1210C GRP 25258 936 758 37 %US	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle Thurl Width	0.25 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44 1.56	High High High Low Tall Strong Deep Open Rib High Pins Wide							
CAN 682056 ire: MAUGHL CAN 5457798 iam: GLEN DF CAN 6185591 IACE PRODUC Milk Fat Pro 05-2006 PL	EPTEMBER 54 100%RHA-I IN STORM-ET 100%RHA-N RUMMOND SH 100%RHA-N CTION +433 +56 +9 577 DAUS +0.7	STORI NA RCT A B/R IMMER-E A RC % +.16 01	V TL TV TL T %R 95	SIRE +245 +40 +8 +0.7	DAM -455 +17	5M 25704 991 767 56 %RIP	BUCKEYE PI +1580N +1463M +1210C GRP 25258 936 758 37 %US 98 %R	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle Thurl Width R Legs-Side View	0.25 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44 1.56 1.96	High High High Low Tall Strong Deep Open Rib High Pins							
CAN 682056 ire: MAUGHL CAN 5457798 iam: GLEN DF CAN 6185591 IACE PRODUC Milk Fat Pro 05-2006	EPTEMBER 54 100%RHA-I IN STORM-ET 100%RHA-N RUMMOND SH 100%RHA-N CTION +433 +56 +9 577 DAUS	STORI NA RCT A B/R IMMER-E A RC % +.16 01	V TL TV TL F 95 HERDS	<b>SIRE</b> +245 +40 +8	<b>DAM</b> -455 +17 -13	GM 25704 991 767 56 %RIP SCE 9%	BUCKEYE PI +1580N +1463M +1210C GRP 25258 936 758 37 %US 98 %R 80 %R	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle Thurl Width R Legs-Side View R Legs-Rear View	0.25 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44 1.56 1.96 4.18	High High High Low Tall Strong Deep Open Rib High Pins Wide							
URSUIT SE CAN 682056 ire: MAUGHL CAN 5457798 am: GLEN DF CAN 6185591 IACE PRODUC Milk Fat Pro 05-2006 PL	EPTEMBER 54 100%RHA-I IN STORM-ET 100%RHA-N RUMMOND SH 100%RHA-N CTION +433 +56 +9 577 DAUS +0.7 2.78	STORI NA RC T IMMER-E A RC % +.16 01 431 h	V TL TV TL F 95 HERDS 77	SIRE +245 +40 +8 +0.7 2.76	DAM -455 +17 -13 +0.3	GM 25704 991 767 56 %RIP SCE 9%	BUCKEYE PI +1580M +1463M +1210C GRP 25258 936 758 37 %US 98 %R 80 %R 80 %R 64 %R	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle Thurl Width R Legs-Side View R Legs-Rear View Foot Angle	0.25 5 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44 1.56 1.96 4.18 2.73	High High High Low Tall Strong Deep Open Rib High Pins Wide Straight							
URSUIT SE CAN 682056 ire: MAUGHL CAN 5457798 am: GLEN DF CAN 6185591 IACE PRODUC Milk Fat Pro 05-2006 PL SCS NM\$ +284	EPTEMBER 54 100%RHA-I IN STORM-ET 100%RHA-N RUMMOND SH 100%RHA-N CTION +433 +56 +9 577 DAUS +0.7 2.78	STORI NA RC T IMMER-E A RC % +.16 01 431 h	V TL TV TL 95 HERDS 77 91	SIRE +245 +40 +8 +0.7	DAM -455 +17 -13 +0.3	5M 25704 991 767 56 %RIP SCE 9% DCE 10% DPR -1.2%	BUCKEYE PI +1580N +1463M +1210C GRP 25258 936 758 37 %US 98 %R 80 %R	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle Thurl Width R Legs-Side View R Legs-Rear View Foot Angle	0.25 5 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44 1.56 1.96 4.18 2.73 2.66	High High High Low Tall Strong Deeb Open Rib High Pins Wide Straight Straight							
URSUIT SE CAN 682056 Ire: MAUGHL CAN 5457798 am: GLEN DF CAN 6185591 IACE PRODUC Milk Fat Pro 05-2006 PL SCS NM\$ +284 IACE TYPE Type	EPTEMBER 54 100%RHA-I IN STORM-ET 100%RHA-N RUMMOND SH 100%RHA-N CTION +433 +56 +9 577 DAUS +0.7 2.78	STORI NA RC T IMMER-E A RC % +.16 01 431 h	V TL TV TL T 95 HERDS 77 91 5 +298	SIRE +245 +40 +8 +0.7 2.76	DAM -455 +17 -13 +0.3 2.94	5M 25704 991 767 56 %RIP SCE 9% DCE 10% DPR -1.2% DAU SC	BUCKEYE PI +1580M +1463M +1210C GRP 25258 936 758 37 %US 98 %R 80 %R 80 %R 64 %R	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle Thurl Width R Legs-Side View R Legs-Rear View	0.25 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44 1.56 1.96 4.18 2.73 2.66 2.36	High High High High Strong Deep Open Rib High Pins Wide Straight Straight Straight Straight Straight							
URSUIT SE CAN 682056 ire: MAUGHL CAN 5457798 am: GLEN DF CAN 6185591 IACE PRODUC Milk Fat Pro 05-2006 PL SCS NM\$ +284	EPTEMBER 54 100%RHA-I IN STORM-ET 100%RHA-N RUMMOND SH 100%RHA-N CTION +433 +56 +9 577 DAUS +0.7 2.78 CM\$ +277	STORI NA RC T IMMER-E A RC % +.16 01 431 h	V TL TV TL T %R 95 HERDS 77 91 \$+298 %R	SIRE +245 +40 +8 +0.7 2.76 SIRE	DAM -455 +17 -13 +0.3 2.94 DAM	BM 25704 991 767 56 %RIP SCE 9% DCE 10% DPR -1.2% DAU SC 81.4	BUCKEYE PI +1580N +1463M +1210C GRP 25258 936 758 37 %US 98 %R 80 %R 64 %R AASC	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle Thurl Width R Legs-Side View R Legs-Rear View Foot Angle Feet & Legs Score Fore Attachment Rear Udder Height	0.25 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44 1.56 1.96 4.18 2.73 2.66 2.36	High High High High Low Tall Strong Deep Open Rib High Pins Wide Straight Straight Straight Straight Straight Straight Straight Straight Straight Straight							
URSUIT SE CAN 682056 ire: MAUGHL CAN 5457798 am: GLEN DF CAN 6185591 IACE PRODUC Milk Fat Pro 05-2006 PL SCS NM\$ +284 IACE TYPE Type	EPTEMBER 84 100%RHA-H IN STORM-ET 100%RHA-N SUMMOND SH 100%RHA-N CTION +433 +56 +9 577 DAUS +0.7 2.78 CM\$ +277 +2.31	STORI NA RCT A B/R IMMER-E A RC % +.16 01 431 H FMS	V TL TV TL T 95 HERDS 95 91 5 + 298 %R 89	SIRE +245 +40 +8 +0.7 2.76 SIRE +1.67	DAM -455 +17 -13 +0.3 2.94 DAM +1.45	BM 25704 991 767 56 %RIP SCE 9% DCE 10% DPR -1.2% DAU SC 81.4	BUCKEYE PI +1580N +1463M +1210C GRP 25258 936 758 37 %US 98 %R 80 %R 64 %R AASC	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle Thurl Width R Legs-Side View R Legs-Rear View Foot Angle Feet & Legs Score Fore Attachment Rear Udder Height	0.25 5 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44 1.56 1.96 4.18 2.73 2.66 2.36 2.01	High High High High Strong Deep Open Rib High Pins Wide Straight Straight Straight Straight Straight							
ONTROLLER SEME CAN 682056 Erre: MAUGHL CAN 5457798 Dam: GLEN DF CAN 6185591 MACE PRODUC Milk Fat Pro 05-2006 PL SCS NM\$ +284 MACE TYPE Type UDC	EPTEMBER 64 100%RHA-I IN STORM-ET 100%RHA-N 200%RHA-N 200%RHA-N 100%RHA-N 577 DAUS +433 +56 +9 577 DAUS +0.7 2.78 CM\$ +277 +2.31 +1.57 +2.91	STORI NA RCT A B/R IMMER-E A RC % +.16 01 431 H FMS	V TL TV TL T 95 HERDS 95 91 5 + 298 %R 89	SIRE +245 +40 +8 +0.7 2.76 SIRE +1.67 +1.57 +1.68	DAM -455 +17 -13 +0.3 2.94 DAM +1.45 +1.22 +1.39	DAU 25704 991 767 56 %RIP SCE 9% DCE 10% DPR-1.2% DAU SC 81.4 BD +2.19	BUCKEYE PI +1580M +1463M +1210C GRP 25258 936 758 37 %US 98 %R 80 %R 64 %R AASC 84.1	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle Thurl Width R Legs-Side View R Legs-Rear View Foot Angle Feet & Legs Score Fore Attachment Rear Udder Height Rear Udder Width	0.25 5 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44 1.56 1.96 1.96 4.18 2.73 2.66 2.36 2.36 2.01 1.91	High High High High Low Tall Strong Open Rib High Pins Wide Straight							
ONTROLLER SEME CAN 682056 Sire: MAUGHL CAN 5457798 Dam: GLEN DF CAN 6185591 MACE PRODUC Milk Fat Pro 05-2006 PL SCS NM\$ +284 MACE TYPE Type UDC FLC 05-2006	EPTEMBER 64 100%RHA-I IN STORM-ET 100%RHA-N 200%RHA-N 200%RHA-N 100%RHA-N 577 DAUS +433 +56 +9 577 DAUS +0.7 2.78 CM\$ +277 +2.31 +1.57 +2.91 278 DAUS	STORI NA RCT A B/R IMMER-E A RC *.16 01 431 H FMS	V TL TV TL T %R 95 HERDS 77 91 \$+298 %R	SIRE +245 +40 +8 +0.7 2.76 SIRE +1.67 +1.57 +1.68	DAM -455 +17 -13 +0.3 2.94 DAM +1.45 +1.22	DAU 25704 991 767 56 %RIP SCE 9% DCE 10% DPR-1.2% DAU SC 81.4 BD +2.19	BUCKEYE PI +1580M +1463M +1210C GRP 25258 936 758 37 %US 98 %R 80 %R 64 %R AASC 84.1 D +2.03	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle Thurl Width R Legs-Side View R Legs-Rear View Foot Angle Feet & Legs Score Fore Attachment Rear Udder Height Rear Udder Width Udder Cleft	0.25 5 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44 1.56 1.96 1.96 4.18 2.73 2.66 2.36 2.01 1.91 0.12	High High High High Joep Open Rib Joh Pins Wide Straight Straig Straight Straight Straight St							
CAN 682056 Sire: MAUGHL CAN 5457798 Dam: GLEN DF CAN 6185591 MACE PRODUC Milk Fat Pro 05-2006 PL SCS NM\$ +284 MACE TYPE Type UDC FLC 05-2006 Breeder Pursi	EPTEMBER 64 100%RHA-I IN STORM-ET 100%RHA-N 200%RHA-N 200%RHA-N 100%RHA-N 577 DAUS +433 +56 +9 577 DAUS +0.7 2.78 CM\$ +277 +2.31 +1.57 +2.91	STORI NA RCT A B/R IMMER-E A RC * +.16 01 431 H FMS 209 H AN	V TL TV TL T 95 HERDS 95 91 5 + 298 %R 89	SIRE +245 +40 +8 +0.7 2.76 SIRE +1.67 +1.57 +1.68	DAM -455 +17 -13 +0.3 2.94 DAM +1.45 +1.22 +1.39	DAU 25704 991 767 56 %RIP SCE 9% DCE 10% DPR -1.2% DPR -1.2% BD +2.19	BUCKEYE PI +1580M +1463M +1210C GRP 25258 936 758 37 %US 98 %R 80 %R 64 %R AASC 84.1	Teat Length Protein Fat Final Score Productive Life Somatic Cell Score Stature Strength Body Depth Dairy Form Rump Angle Thurl Width R Legs-Side View R Legs-Rear View Foot Angle Feet & Legs Score Fore Attachment Rear Udder Height Rear Udder Width	0.25 5 0.46 2.43 3.30 0.78 2.46 2.73 1.59 1.78 1.36 0.44 1.56 1.96 4.18 2.73 2.66 2.36 2.01 1.91 0.12 1.48	High High High High Low Tall Strong Open Rib High Pins Wide Straight							

## Which bull would improve your herd the most?

ME (mature equivalent) milk yield	0.30
ME fat yield	0.30
ME protein yield	0.30
Fat percent	0.58
Protein percent	0.51
Lactose percent	0.43
Age at first calving	0.14
First calving interval	0.05
Lifetime actual milk yield	0.15
Lifetime actual fat yield	0.15
Lifetime actual protein yield	0.14
Days of productive life	0.13
Somatic cell score, lactation average	0.10
Lifetime net income	0.20
Productive life, USDA	0.085