A journey of technology that started with sex semen

STgenetics®

“SUSTAINABILITY in everything we do.”

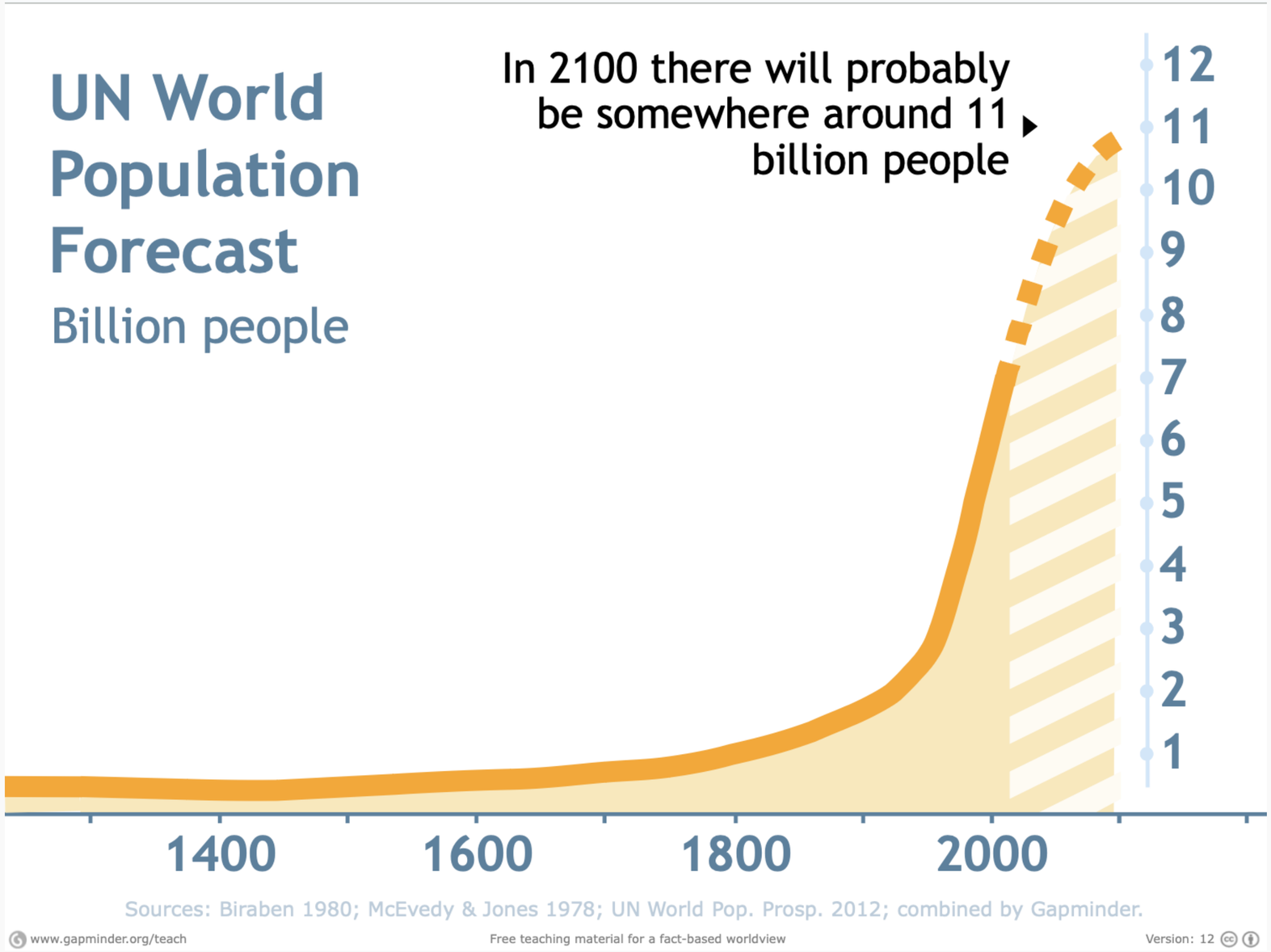
Our goal

A sustainable future by utilizing Biotechnology, Bioinformatics and Biosensors to Improve Efficiencies in animal protein production.

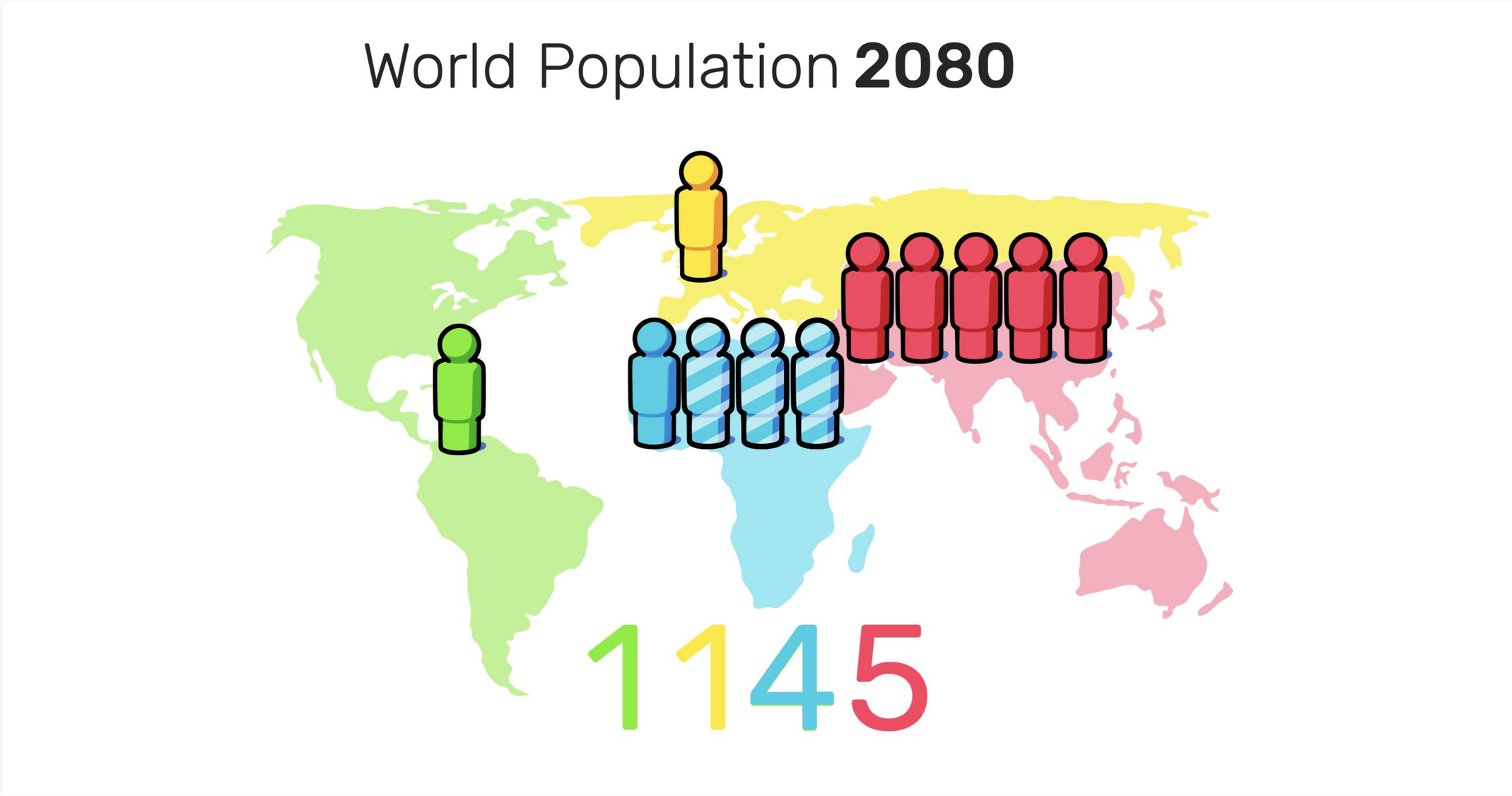
STgen Inc.

STgen Inc.

In about 80 years, the world population will peak



Will there be enough food?



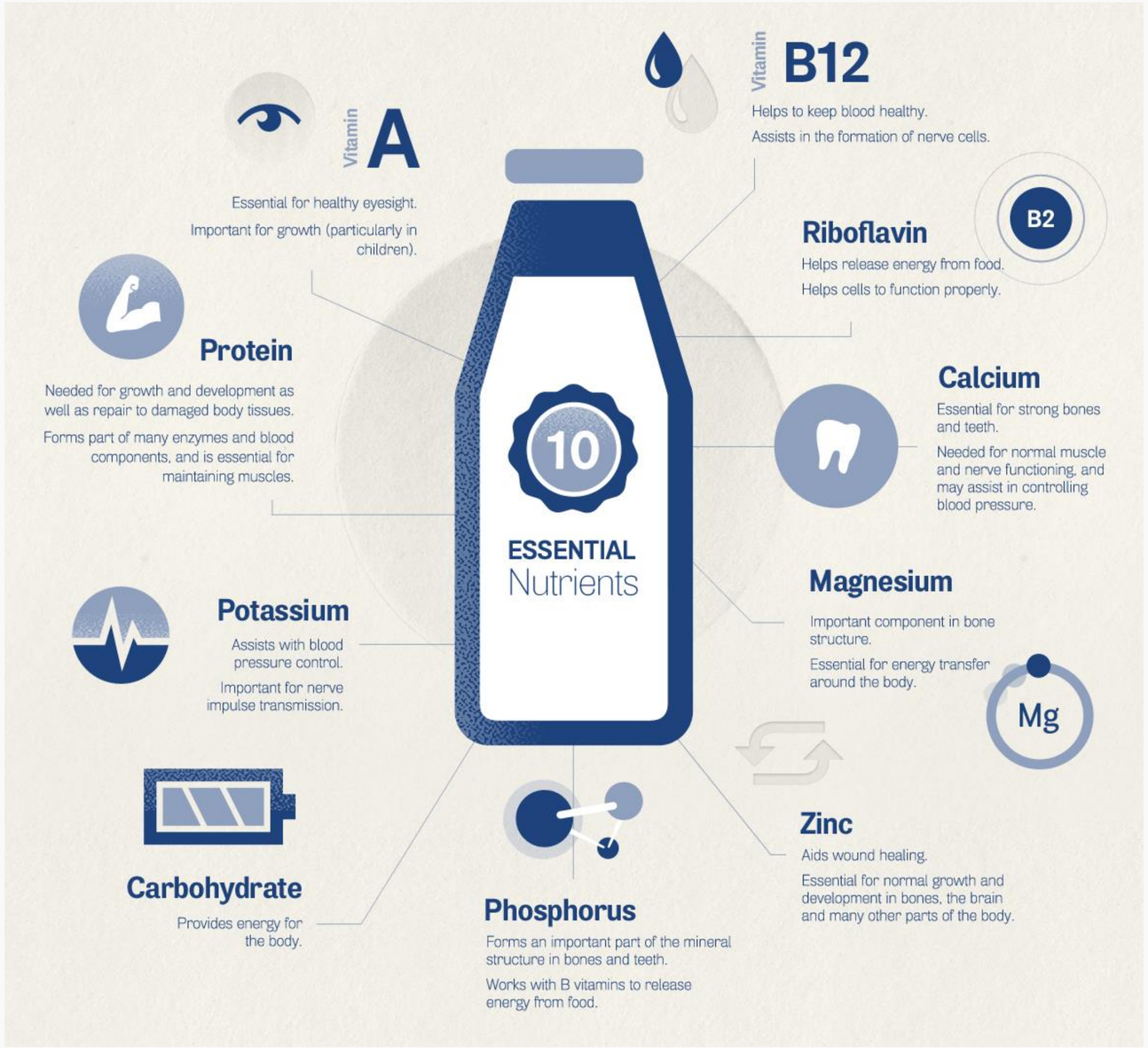
Source: Factfulness, Hans Rosling, 2018

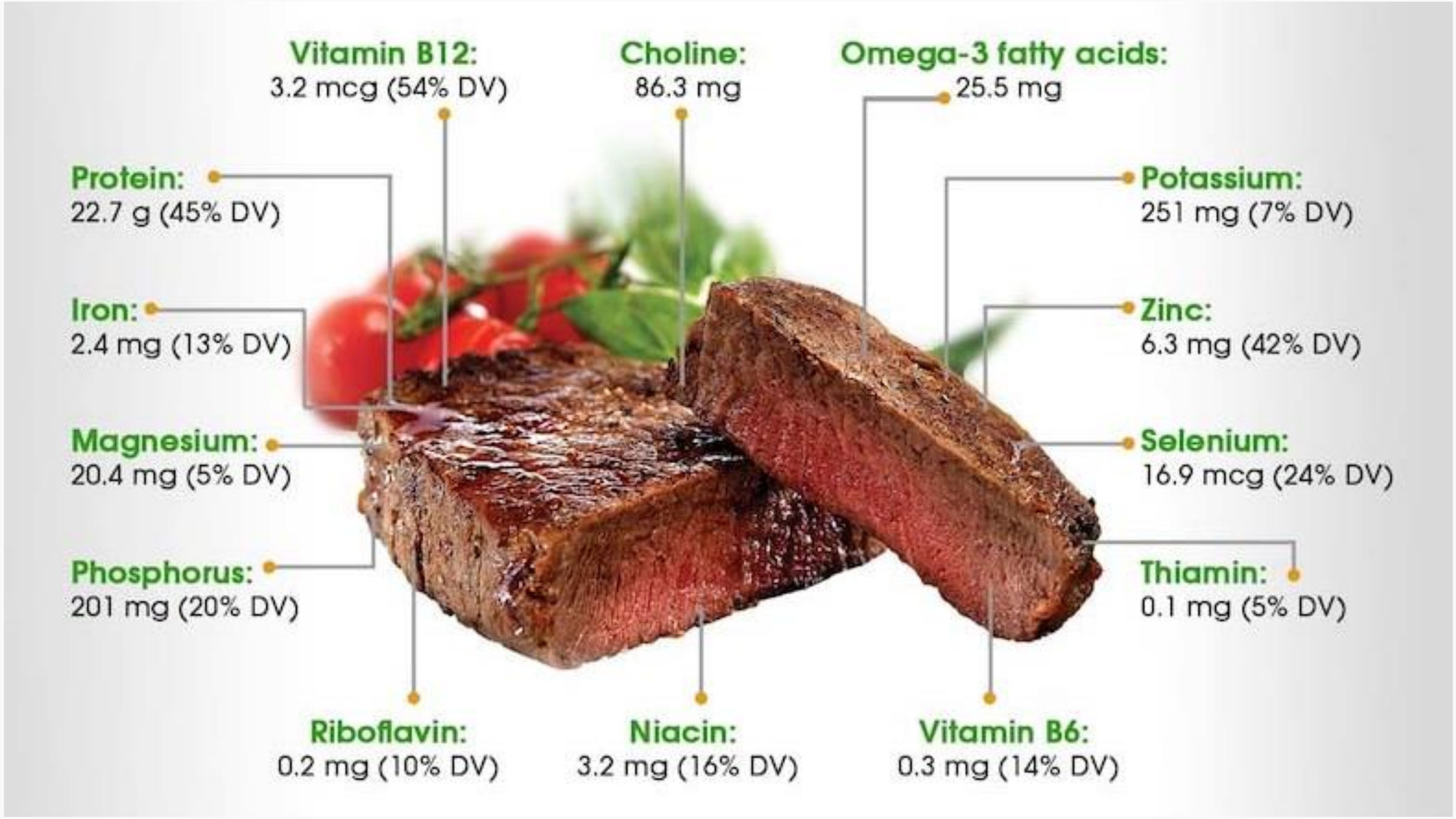
Nutrient Found in Red Meat and Dairy Products Could Boost Cancer Therapies

November 29, 2023

Credit: nehopelon/Getty Iimages

University of Chicago researchers have identified a nutrient derived from beef, lamb, and dairy products that could enhance cancer therapies (https://www.insideprecisionmedicine.com/?s=cancer+therapies).


Vitamin A
Essential for healthy eyesight.
Important for growth (particularly in children).
Protein
Needed for growth and development as well as repair to damaged body tissues.
Forms part of many enzymes and blood components, and is essential for maintaining muscles.
Potassium
Assists with blood pressure control.
Important for nerve impulse transmission.
Carbohydrate
Provides energy for the body.
Phosphorus
Forms an important part of the mineral structure in bones and teeth.
Works with B vitamins to release energy from food.
Zinc
Aids wound healing.
Essential for normal growth and development in bones, the brain and many other parts of the body.
Magnesium
Important component in bone structure.
Essential for energy transfer around the body.
Mg
Calcium
Essential for strong bones and teeth.
Needed for normal muscle and nerve functioning, and may assist in controlling blood pressure.
Riboflavin
Helps release energy from food.
Helps cells to function properly.
B2
Vitamin B12
Helps to keep blood healthy.
Assists in the formation of nerve cells.
10
ESSENTIAL
Nutrients


Vitamin B12:
3.2 mcg (54% DV)
Choline:
86.3 mg
Omega-3 fatty acids:
25.5 mg
Protein:
22.7 g (45% DV)
Potassium:
251 mg (7% DV)
Iron:
2.4 mg (13% DV)
Zinc:
6.3 mg (42% DV)
Magnesium:
20.4 mg (5% DV)
Selenium:
16.9 mcg (24% DV)
Phosphorus:
201 mg (20% DV)
Thiamin:
0.1 mg (5% DV)
Riboflavin:
0.2 mg (10% DV)
Niacin:
3.2 mg (16% DV)
Vitamin B6:
0.3 mg (14% DV)

Technology platforms to improve the entire animal protein production value chain

Sex-Sorted Sperm

Optimize herd and accelerate genetic progress

Reproduction and Genomics

Identify gene influencing and advantageous traits

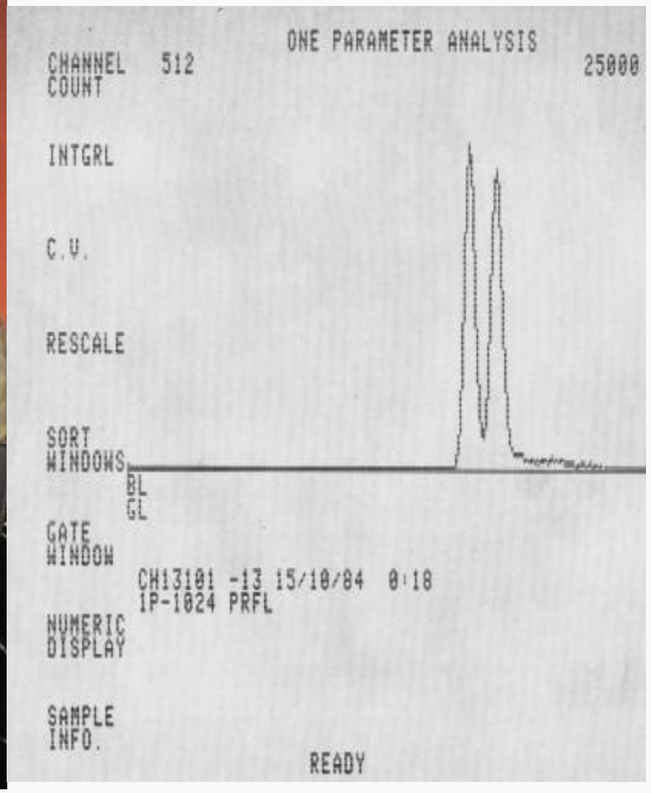
Bioinformatics and Biosensors

Monitoring, traceability and analysis of animal health

Premium Genetics

Improve genetics and output / yield

Dr. Larry Johnson and Glenn Welch Setting up the Modified Coulter EPICS® V



First Instrument to sort Chinchilla Sperm Nuclei

(7.5% DNA Difference) with purity above 95%

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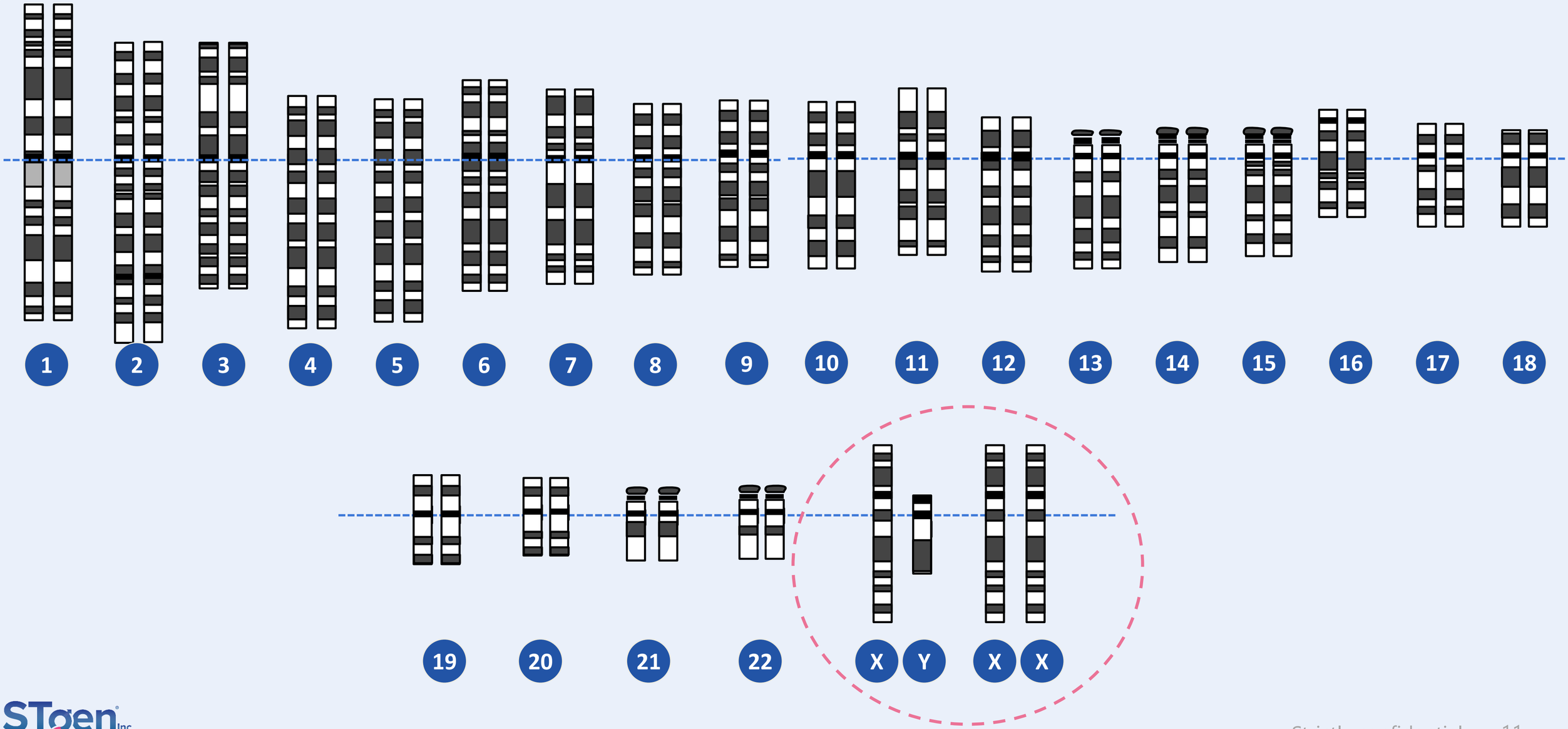
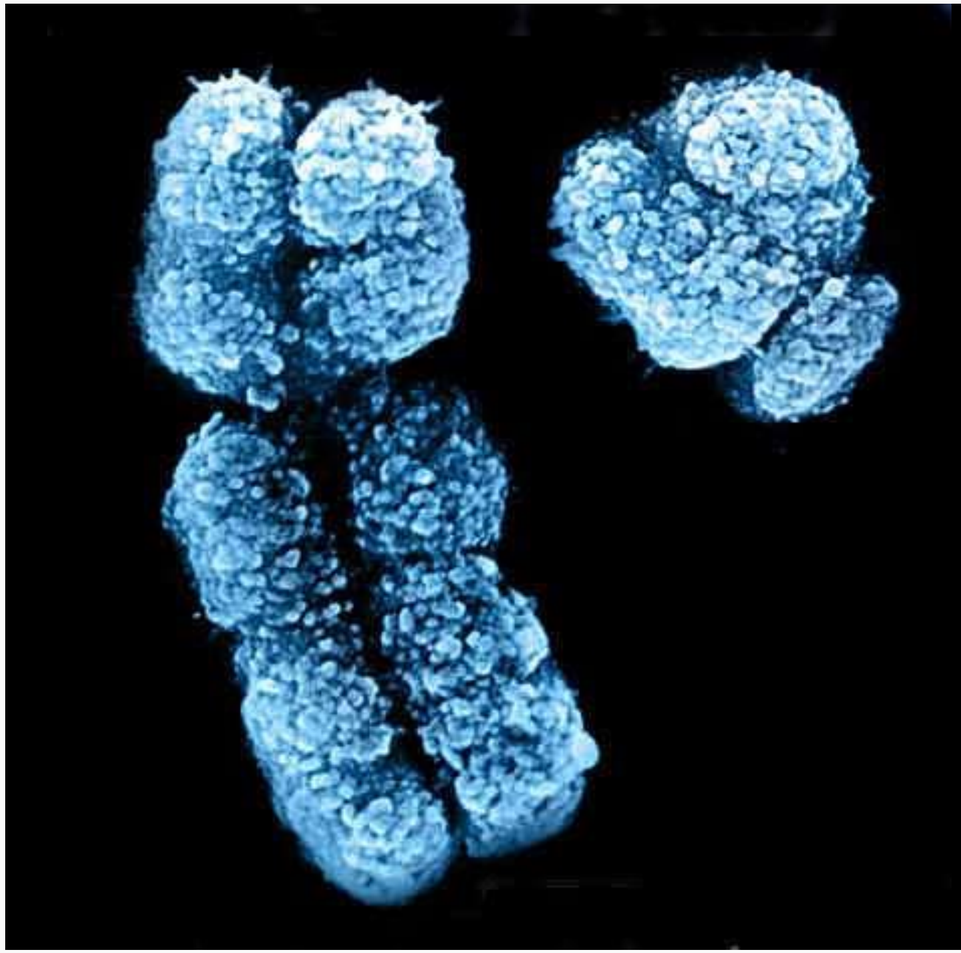
23 pairs of chromosomes



A difference in size



Mammals have one pair of sex chromosomes

XX – Female
XY – Male

Eggs – X
Sperm – X or Y

27 years of innovation

1997
XY licenses sex-sorting technology from the USDA

2002
STgen licenses XY

2007
STgen acquires XY

2008
STgen acquires Monsanto's patents on sex-sorting technology

2009
Technology enhancements increase process efficiency and comparability with conventional sperm conception rate

cytonome-ST

2015
SexedULTRA
product with 2.1M cells per straw and 90% purity launched

STgen launches STgenetics a proprietary bovine genetics business and acquires leading pig genetics company, Fastgenetics

2016
STgen acquires innovative genomic testing platform

GeneticVisions-ST™

2017
4M product with 4M cells per straw launched

STgen launches Ecofeed which ranks 500,000 heifers per year for our customers

STgen becomes majority shareholder[1] in UK's largest bull stud

cogent

2018
STgen launches innovative genomic mating software

Chromosomal Mating

2020
4M High Purity
product with 95% or greater purity launched

2022
STgen acquires porcine genetics company

Acuity™

Ultraplus product with 3% points higher fertility launched

2023
STgen launches

AcuFast
a new proprietary bovine genetics brand

Expected launch of

Farmfits
the next generation of health monitoring devices

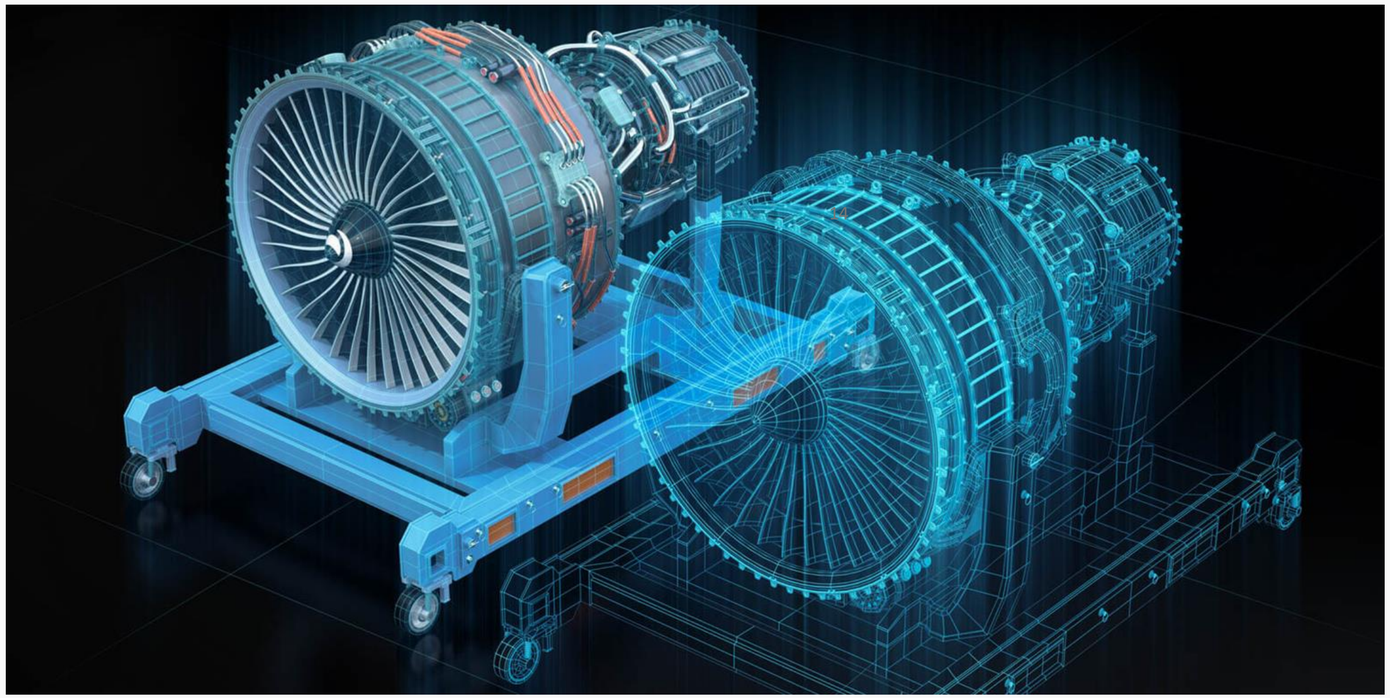
STgen Inc.

[1] STgen acquired the remaining 24% of Cogent Breeding Limited in October 2018.

What is a Digital Twin?

It helps in predicting, optimizing, and improving decision making.

It has revolutionized the industrial world, particularly the manufacturing industry, construction and healthcare sector, smart cities, and energy industry.



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Evolution of Genesis sperm sorter platform

Genesis I
(upgrade for MoFlo SX sperm sorter)

2010-2011

Genesis IIA & IIB
(fully functional 2x sperm sorter)

2012-2013

Genesis III (fully functional 3x sperm sorter)

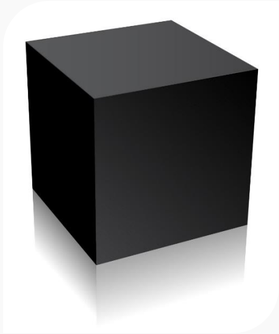
Genesis + 9 Automation upgrades

2014-2022

Genesis Viper
(1x Development Platform)

2021

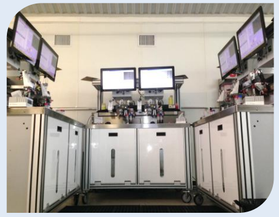
SUPERGEN Advanced cell sortre



2024

Sperm sorter platform impact on production lab scale

80
sort heads



>1080
sort heads

~ 4 operators/sorter

~ 24 sorter/operator

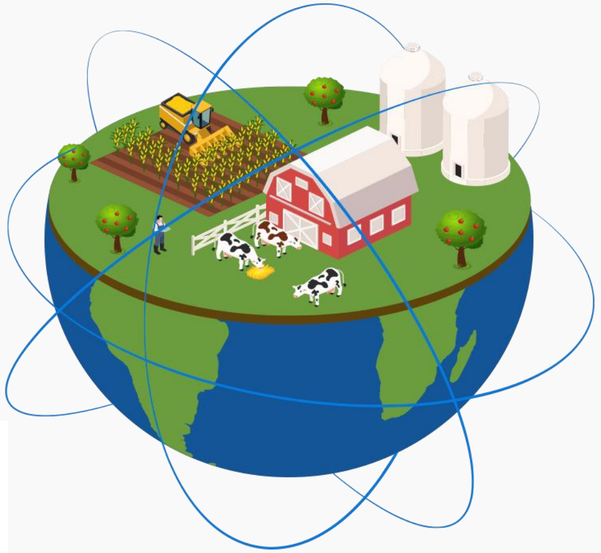
Our core technologies

Sex-Sorted Services

Optimize herd and accelerate genetic progress

Reproduction and Genomics

Identify gene influencing and advantageous traits



Premium Genetics

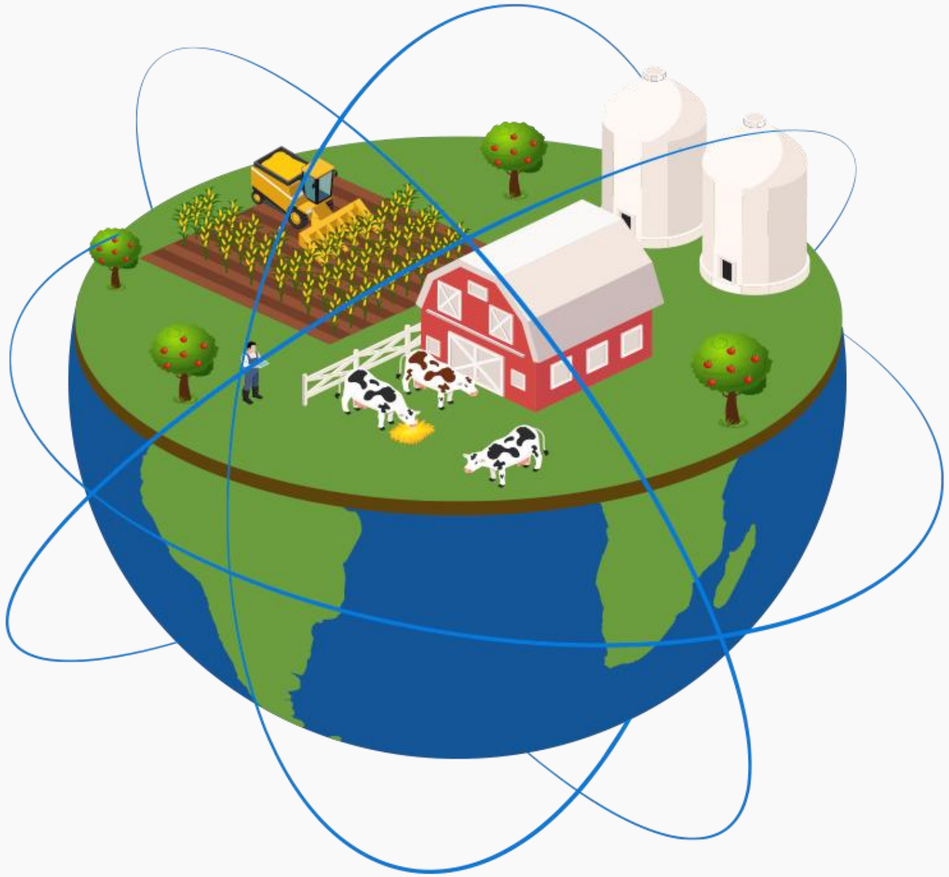
Improve genetics and output / yield

Bioinformatics and Biosensors

Monitoring, traceability and analysis of animal health

Reproduction and Genomics

Identify gene influencing and advantageous traits



THE SOLUTION :

* ACCELERATED GENETIC IMPROVEMENT

* ARTIFITIAL INSEMINATION IS THE MAGIC DELIVERY SYSTEM

Significant improvements can be made: USA Broiler Performance

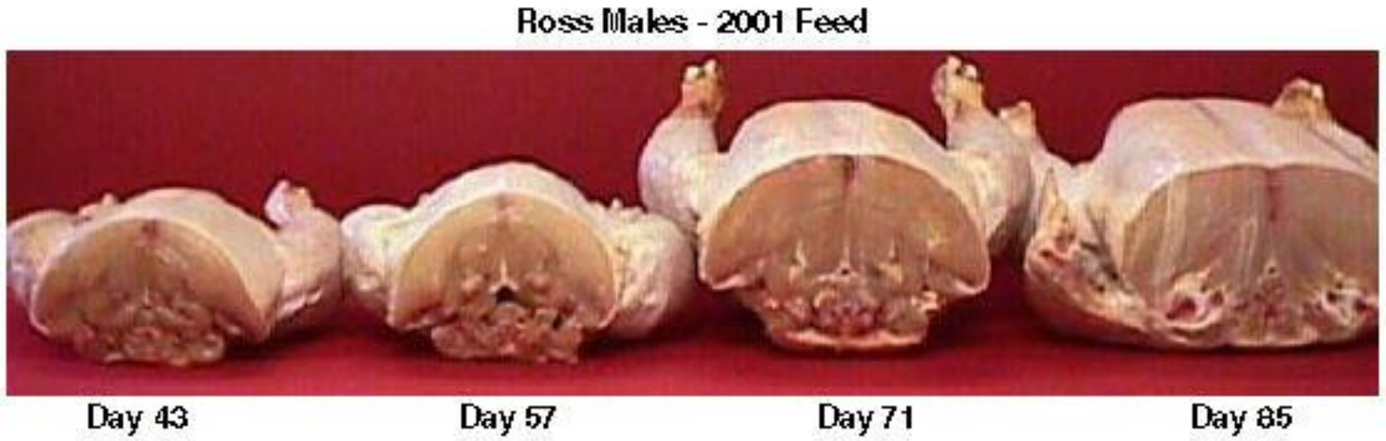
Year	Days to Market	Market Weight (lbs.)	Feed Conversion	Mortality (%)
1950	70	3.08	3.0	8.0
1975	56	3.76	2.1	5.0
2000	47	5.03	1.9	5.0
2021	47	6.46	1.67	5.3

Source: National Chicken Council

1957 *vs.* 2001
Feed in 2001

1957

2001



Source: Havenstein - http://www.lohmann-information.com/vol41_art5.html

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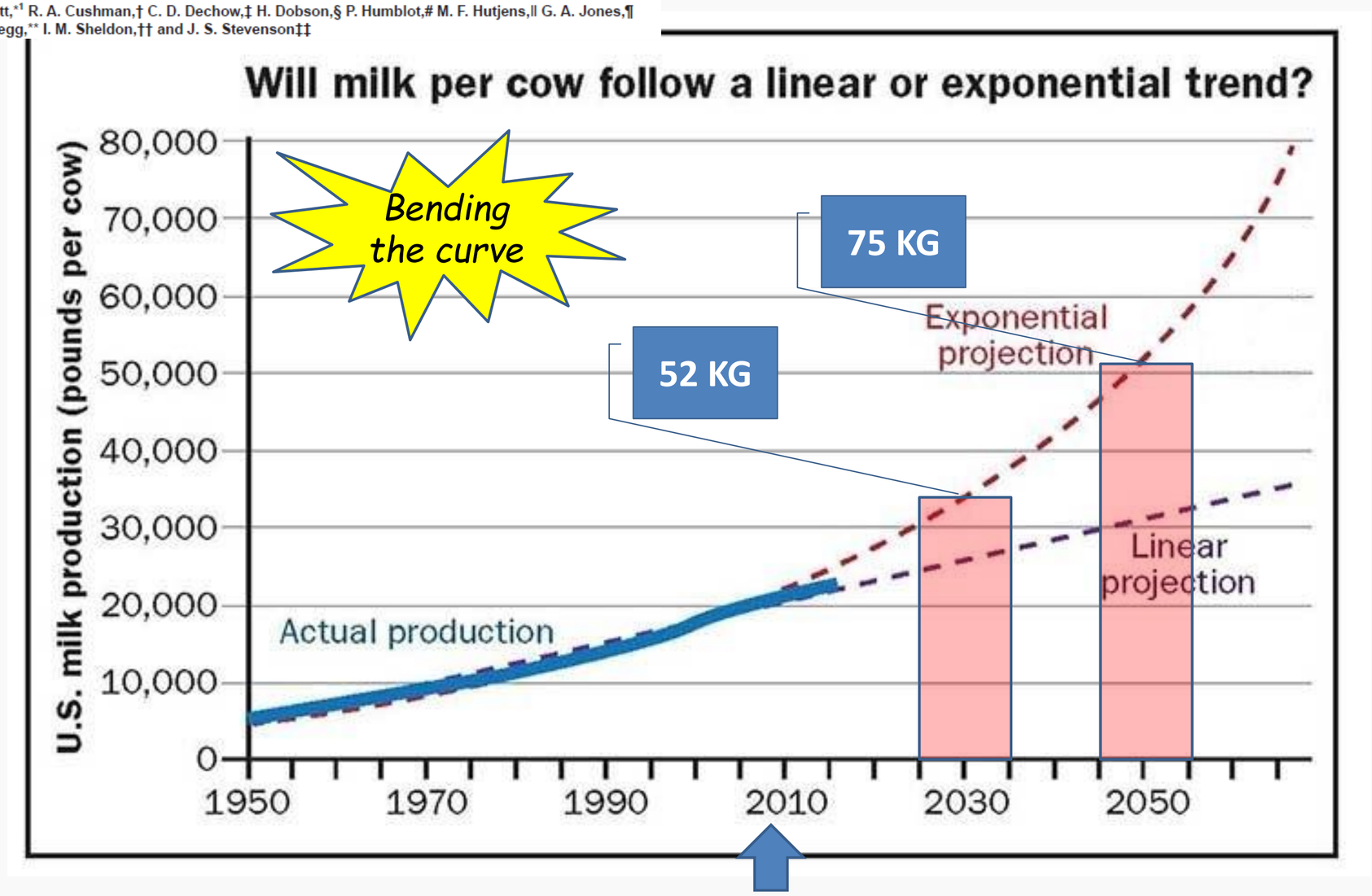
$$\frac{\text{Selection Accuracy} \times \text{Genetic Varaibility} \times \text{Selection Intensity}}{\text{Generation Interval}}$$

J. Dairy Sci. 101:3722–3741
https://doi.org/10.3168/jds.2017-14025

Invited review: **Learning from the future—A vision for dairy farms and cows in 2067**

J. H. Britt,*[1] R. A. Cushman,† C. D. Dechow,‡ H. Dobson,§ P. Humblot,# M. F. Hutjens,‖ G. A. Jones,¶ P. S. Ruegg,** I. M. Sheldon,†† and J. S. Stevenson‡‡

The Bovine
INFORMATIVE AND THOUGHT PROVOKING NEWS AND ARTICLES FOR THE DAIRY INDUSTRY



THE BOVINE GENOME

And the OMICS era: GenOMICS, NutriNNOMICS, MetabolOMICS, PhenOMICS

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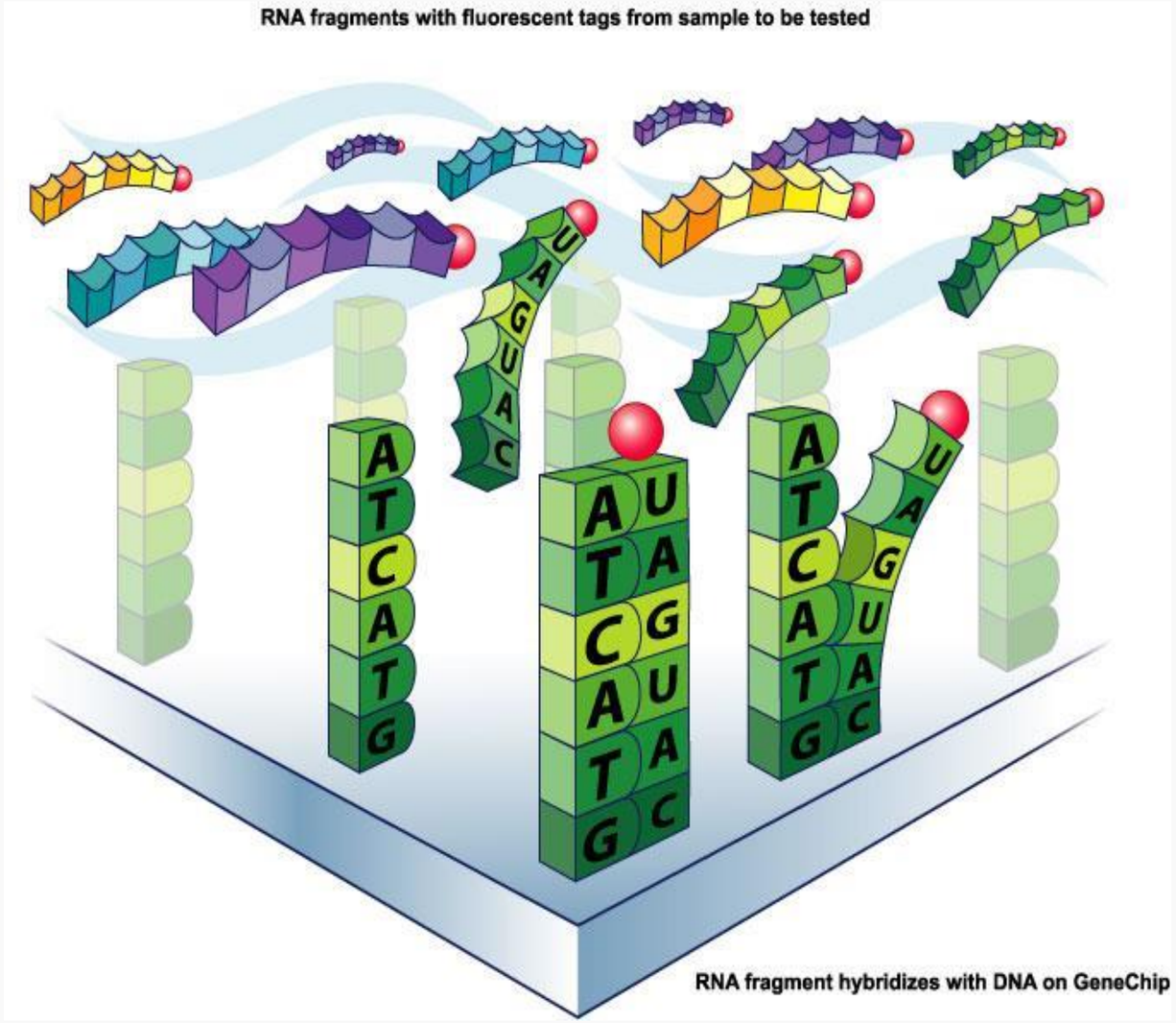


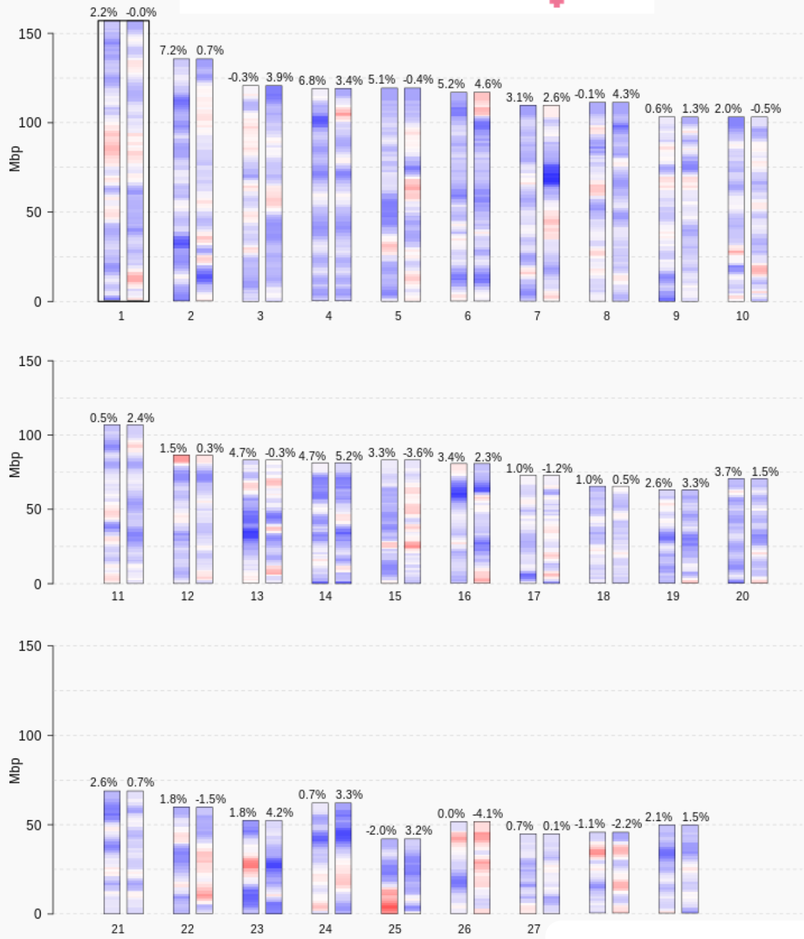
Label probe sequence hybridize to target DNA segments

Molecular breeding approaches

GeneticVisions - ST™

DNA sequencing technology

Chromosomal Painting



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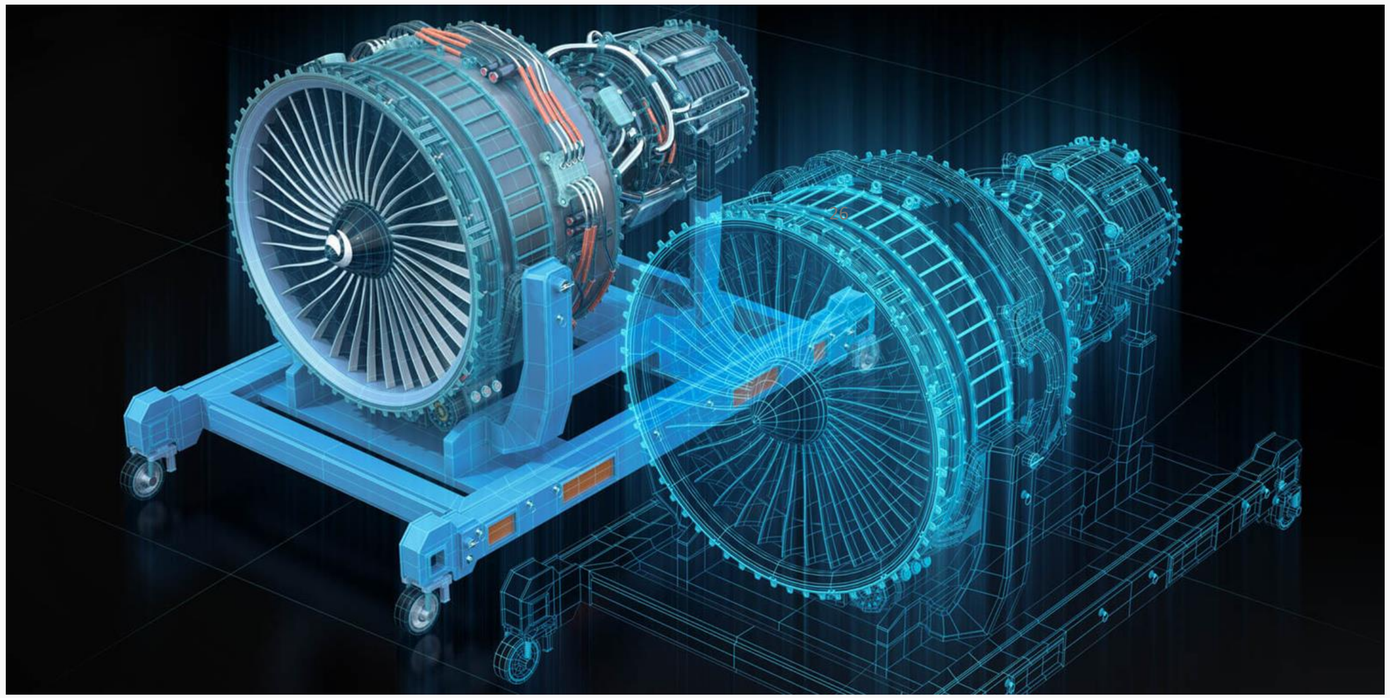
What is a Bioinformatics Twin?

It helps in predicting, optimizing, and improving decision making.

It has revolutionized the industrial world, particularly the manufacturing industry, construction and healthcare sector, smart cities, and energy industry.



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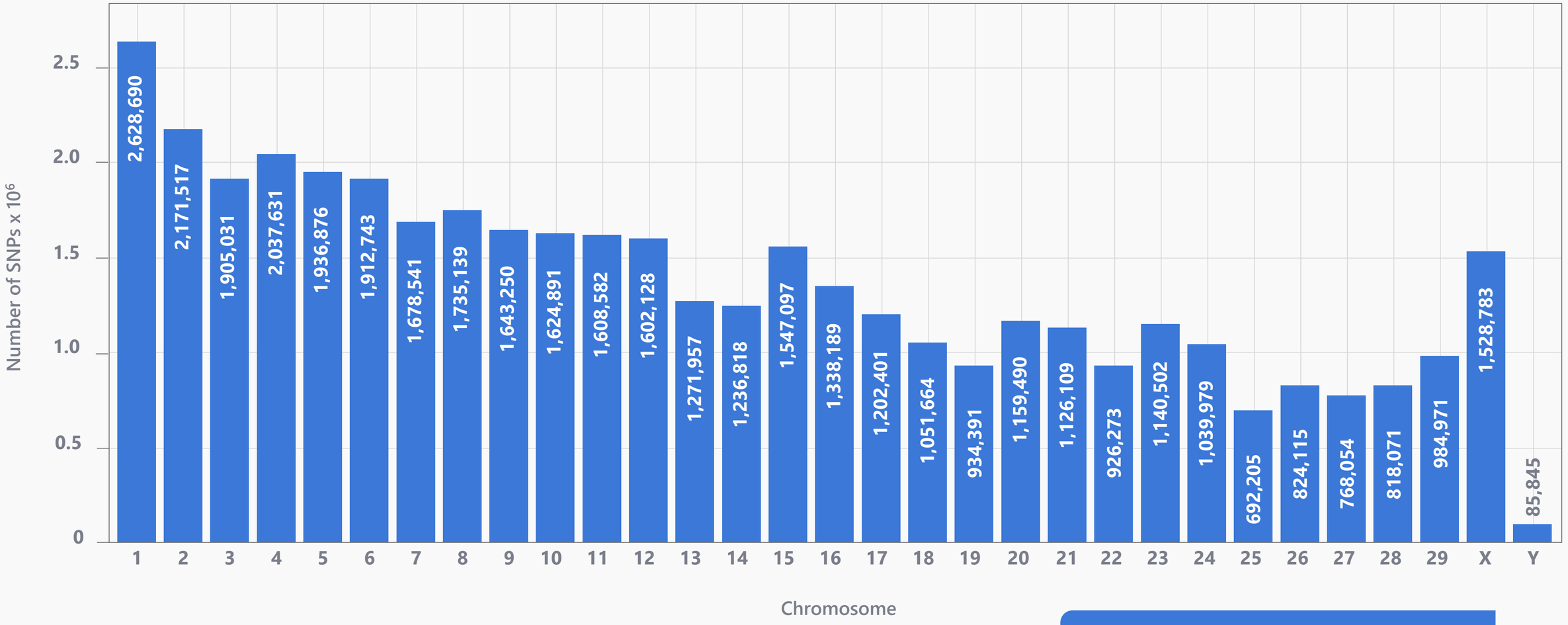
Number of Biallelic (SNPs) variants – From 80k to 40M



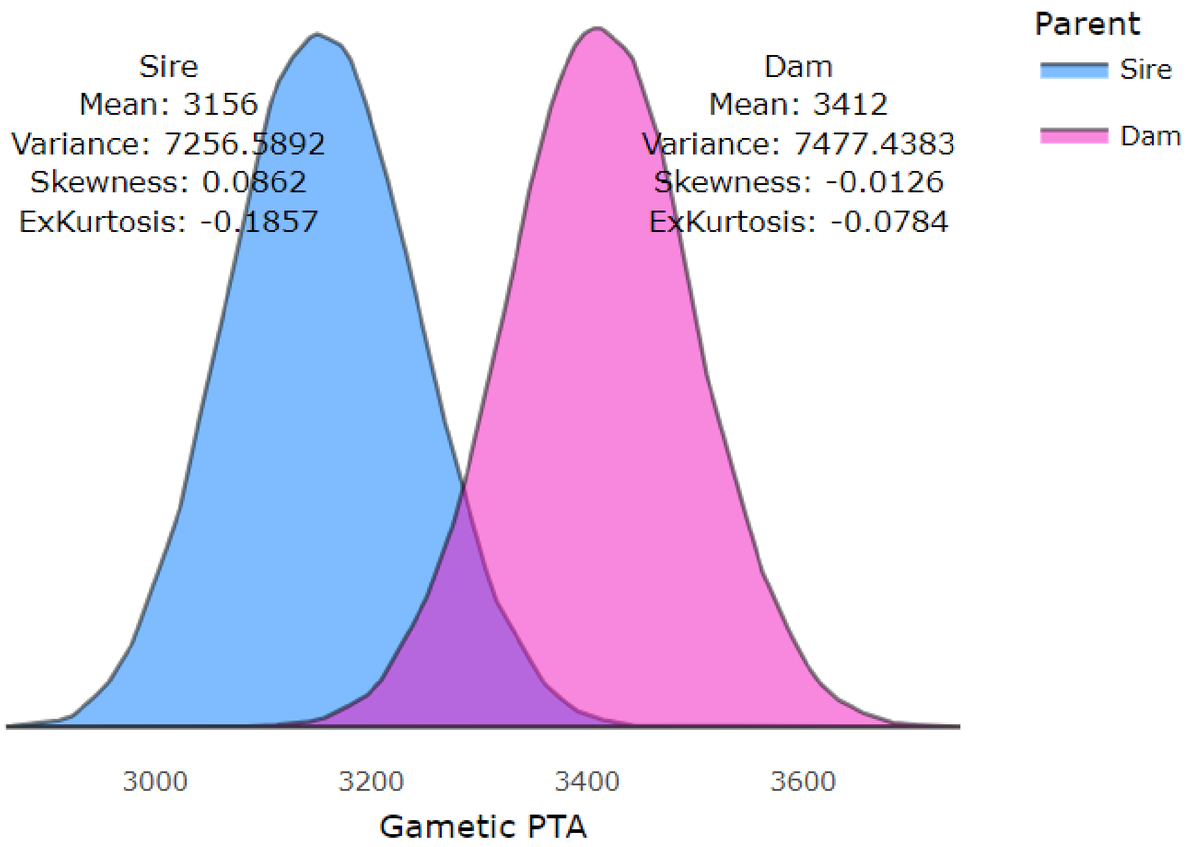
*Total SNPs : **42,161,933***

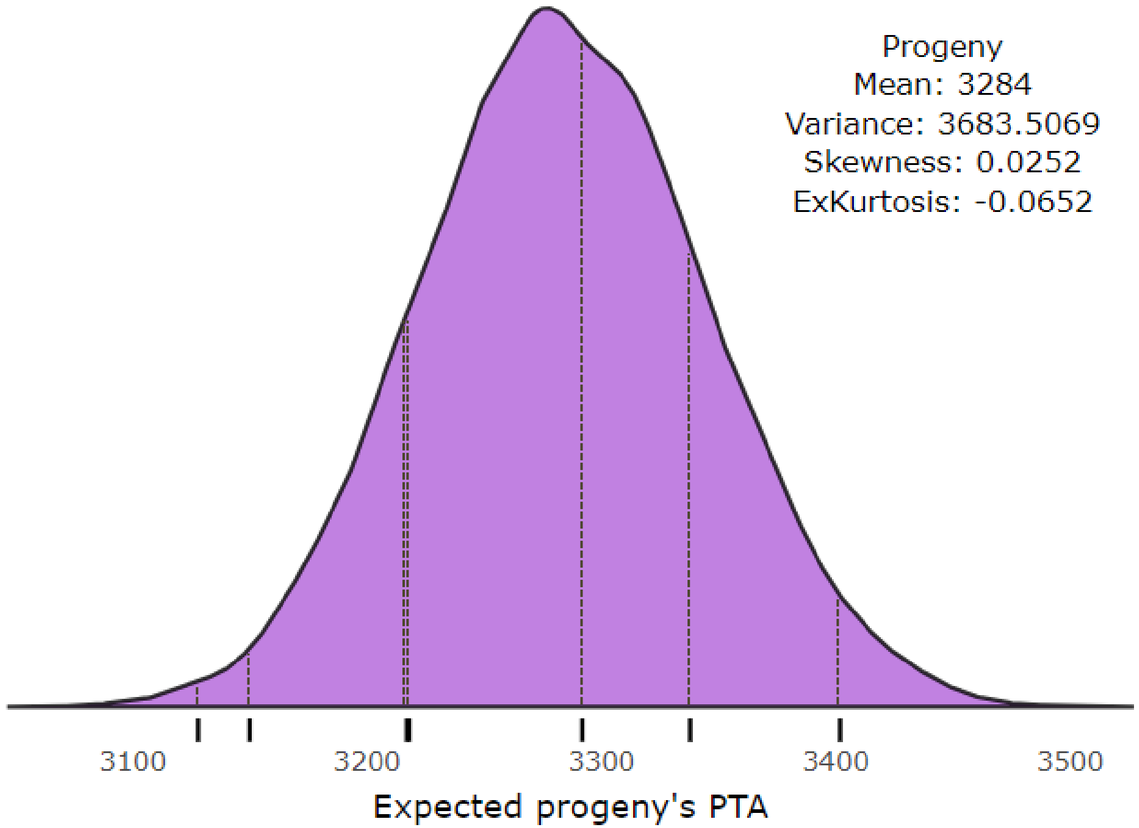
Combining molecular breeding, JIVETs, fetal genomics, and NT

Chromosomal Painting

Legit x Outreach

Cow	Bull	Mean	Variance	Skewness	ExKurtosis	iMating Probability > 3412	Relationship	ExpInbreeding
HO840003267664512	HO840003213126620	3284	3683.51	0.0252	-0.0652	3416.37	1.77%	2.80%	1.40%





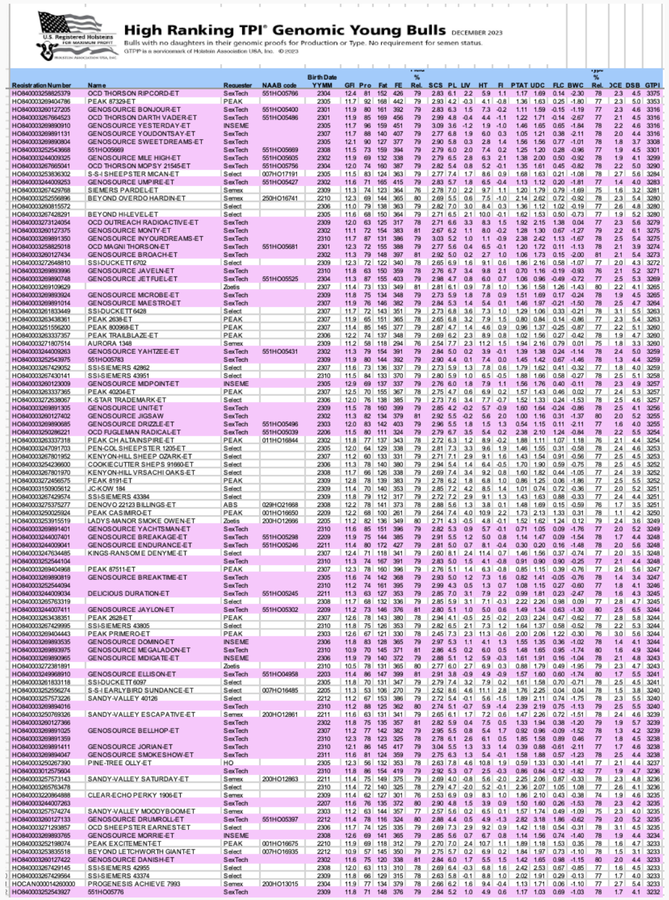
STgen Inc.

STgenetics is leading the genetic race in the US

Top 100 TPI Bulls DECEMBER 2023

(Semen Status is ACTIVE or LIMITED with a minimum of 80% traditional US reliability OR 85% Genomic reliability for production and type)

						PRODUCTION						HEALTH				CONFORMATION					
Rank	Name		% RHA	NAAB	PRO	FAT	MILK	FE	%R	SCS	PL	%R	LIV	FI	PTAT	%R	UDC	FLC	BWC	TPI
1	GENOSOURCE CAPTAIN-ET	TR TC	99-I	551HO04119	83	150	2474	405	99	3.09	5.0	89	-0.2	0.0	1.23	99	1.56	0.54	-2.32	3253G
2	FARNEAR UPSIDE-ET	TR TC	99-I	551HO04034	74	107	2336	324	99	2.81	6.7	88	2.3	1.9	0.49	95	1.09	0.15	-1.69	3112G
3	LADYS-MANOR OUTCOME-ET	TR TP	99-I	551HO04343	55	102	1074	242	90	2.69	4.4	81	1.1	1.5	1.75	87	2.27	0.97	0.51	3078G
4	PLAIN-KNOLL RENEGAD TROOPER	TR TP	99-I	14HO15179	62	107	939	266	93	3.01	4.8	84	1.1	1.4	1.84	89	1.42	1.72	0.70	3063G
5	DELICIOUS CHARL HOLDON-ET	TR CD	99-I	551HO03823	69	105	2008	325	99	2.63	5.6	89	1.5	1.6	0.54	94	1.10	-1.05	-1.37	3060G



High Ranking TPI® Genomic Young Bulls DECEMBER 2023

Bulls with no daughters in their genomic proofs for Production or Type. No requirement for semen status.

GTPI® is a servicemark of Holstein Association USA, Inc. ©2023

Registration Number	Name	Requester	NAAB code	Birth Date YYMM	GFI	Pro	Fat	FE	Rel.	SCS	PL	LIV	HT	FI	PTAT	UDC	FLC	BWC	%Rel.	JCE	DSB	GTPI
HO840003258625379	OCD THORSON RIPCORD-ET	SexTech	551HO05766	2304	12.4	81	152	426	79	2.83	6.1	2.2	5.9	1.1	1.17	1.69	0.14	-2.30	78	2.3	4.5	3375
HO840003209434786	PEAK 8732HET	PEAK		2305	11.7	92	168	442	79	2.93	4.2	-0.3	4.1	-0.8	1.36	1.63	0.25	-1.80	77	2.3	5.0	3353
HO840003260127205	GENOSOURCE BONJOUR-ET	SexTech	551HO05400	2301	11.9	80	161	392	79	2.83	6.3	1.5	7.3	-0.2	1.11	1.59	-0.15	-1.19	77	2.3	4.6	3316
HO840003267664523	OCD THORSON DARTH VADER-ET	SexTech	551HO05486	2301	11.9	85	169	456	79	2.99	4.8	-0.4	4.4	-1.1	1.22	1.71	-0.14	-2.67	77	2.1	4.5	3316
HO840003269890910	GENOSOURCE YESTERDAY-ET	INSEME		2305	11.7	96	159	451	79	3.09	3.6	-1.2	1.9	-1.0	1.46	1.65	0.65	-1.84	78	2.2	4.6	3316
HO840003269891111	GENOSOURCE YOUDONTSAY-ET	SexTech		2307	11.7	88	140	407	79	2.77	6.8	1.9	6.0	-0.3	1.05	1.21	0.38	-2.11	78	2.0	4.4	3316
HO840003269893804	GENOSOURCE SWEETDREAMS-ET	SexTech		2305	12.1	90	127	377	79	2.90	5.8	0.3	2.8	1.4	1.56	1.56	0.77	-1.01	78	1.8	3.7	3308
HO840003252543668	551HO05669	SexTech	551HO05669	2308	11.5	73	159	394	79	2.79	6.0	2.0	7.4	0.2	1.25	1.20	0.28	-0.96	77	1.9	4.5	3301
HO840003244093525	GENOSOURCE MILE HIGH-ET	SexTech	551HO05935	2302	11.9	69	132	338	79	2.79	6.5	2.8	6.3	2.1	1.38	2.00	0.50	-0.92	78	1.9	4.1	3299
HO840003267665941	OCD THORSON MOPSY 2154SET	SexTech	551HO05756	2304	12.0	74	160	387	79	2.82	5.4	0.8	5.2	-0.1	1.35	1.61	0.45	-0.82	78	2.2	5.0	3290
HO840003253830832	S-S-I SHEEPSTER MICAH-ET	Select	007HO17191	2305	11.5	83	124	363	79	2.77	7.4	1.7	8.6	0.9	1.68	1.63	0.21	-1.08	78	2.7	5.6	3284
HO840003244093253	GENOSOURCE UMPIRE-ET	SexTech	551HO05427	2302	11.6	71	165	415	79	2.83	5.7	1.8	6.5	-0.4	1.13	1.12	0.20	-1.81	77	1.4	4.0	3283
HO840003267425768	SIEMERS PARDELET	Semex		2309	11.3	74	123	364	76	2.79	7.0	2.2	9.7	1.1	1.20	1.79	0.79	-1.69	75	1.6	3.2	3281
HO840003252559896	BEYOND OVERDO HARDIN-ET	Semex	293HO16741	2210	12.3	69	144	365	80	2.69	5.5	0.6	7.5	-1.0	2.14	2.62	0.72	-0.92	76	2.3	5.4	3280
HO840003269815572	Select			2306	11.0	79	138	363	79	2.82	7.0	3.0	8.4	0.3	1.36	1.12	1.02	-0.19	77	2.6	4.8	3280
HO840003267426291	BEYOND HIVELEVEL-ET	SexTech		2305	11.6	68	150	364	79	2.71	6.5	2.1	10.0	-0.1	1.62	1.53	0.50	-0.73	77	1.9	5.2	3280
HO840003273124054	OCD OUTREACH RADIOACTIVE-ET	SexTech		2309	12.0	63	125	317	78	2.71	6.6	3.3	8.3	1.5	1.92	2.15	1.38	0.04	77	2.3	5.6	3279
HO840003269127375	GENOSOURCE MONTY-ET	SexTech		2302	11.1	72	154	383	81	2.67	6.2	1.1	8.0	-0.2	1.28	1.30	0.67	-1.27	79	2.2	6.1	3275
HO840003269891350	GENOSOURCE INYOURDREAMS-ET	SexTech		2310	11.7	87	131	386	79	3.03	5.2	1.0	1.1	-0.9	2.38	2.42	1.13	-1.67	78	2.5	5.4	3275
HO840003258825018	OCD MAGNI THORSON-ET	SexTech	551HO05681	2301	12.3	72	155	388	79	2.77	5.6	0.4	6.5	-0.1	1.20	1.72	0.11	-1.13	78	2.1	3.9	3274
HO840003269127434	GENOSOURCE BROACH-ET	SexTech		2302	11.3	79	148	397	81	2.82	5.0	0.2	2.7	1.0	1.06	1.73	0.15	-2.00	81	2.1	5.4	3273
HO840003272648810	SSI-DUCKETT 6702	Select		2309	12.3	72	122	340	78	2.65	6.9	1.6	9.1	0.6	1.86	2.16	0.58	-1.07	77	2.0	4.3	3272
HO840003269893990	GENOSOURCE JAVELIN-ET	SexTech		2310	11.8	63	150	359	78	2.76	6.7	3.4	9.8	2.1	0.70	1.16	-0.19	-0.93	76	2.1	5.2	3271
HO840003269890748	GENOSOURCE JETFUEL-ET	SexTech	551HO05525	2304	11.3	87	155	403	79	2.98	4.7	0.8	6.0	0.7	1.06	0.96	-0.49	-0.72	77	2.5	5.3	3269
HO840003269103628	Zoetis			2307	11.4	71	133	349	81	2.81	6.1	0.9	7.4	1.0	1.36	1.58	1.26	-1.43	80	2.2	4.1	3265
HO840003269893924	GENOSOURCE MICROBE-ET	SexTech		2309	11.8	75	134	348	79	2.73	5.9	1.8	7.8	0.9	1.51	1.69	0.17	-0.24	78	1.9	4.5	3265
HO840003269891014	GENOSOURCE MAESTRO-ET	SexTech		2307	11.9	76	146	382	79	2.84	5.3	1.4	5.4	0.1	1.46	1.97	-0.21	-1.50	78	2.5	4.7	3264
HO840003261833469	SSI-DUCKETT 6408	Select		2307	11.7	72	143	351	79	2.73	6.8	3.6	7.3	1.0	1.29	1.76	0.33	-0.21	78	3.1	5.5	3263
HO840003263438361	PEAK 2639-ET	PEAK		2307	11.9	65	151	365	78	2.65	6.8	3.2	7.9	1.5	0.80	0.84	0.14	-0.86	77	2.3	5.4	3263
HO840003251556203	PEAK 8009RET	PEAK		2307	11.4	85	145	377	79	2.87	4.7	1.4	4.6	0.9	0.96	1.37	-0.25	-0.87	77	2.2	5.1	3260
HO840003263337357	PEAK TRAILBLAZE-ET	PEAK		2306	12.2	74	137	348	79	2.69	6.2	2.3	8.9	0.8	1.02	1.56	0.27	-0.42	78	1.9	4.7	3260
HO840003271907514	AURORA 1348	SexTech		2309	11.2	58	118	294	76	2.54	7.7	2.3	11.2	1.5	1.94	2.16	0.79	0.01	75	1.8	3.3	3260
HO840003244093263	GENOSOURCE YAHTZEE-ET	SexTech	551HO05431	2302	11.3	79	154	391	79	2.84	5.0	0.2	3.9	-0.1	1.39	1.38	0.24	-1.14	78	2.4	5.0	3259
HO840003252543975	551HO05783	SexTech		2309	11.9	80	144	392	79	2.90	4.4	0.1	7.4	0.0	1.45	1.42	0.67	-1.46	78	1.3	4.4	3259
HO840003267429052	SSI-SIEMERS 42892	Select		2307	11.6	73	136	337	79	2.73	5.9	1.3	7.8	0.6	1.79	1.62	0.41	-0.32	77	1.8	4.0	3259
HO840003267430141	SSI-SIEMERS 43951	Select		2310	11.5	84	133	370	79	2.80	5.9	1.0	6.5	-0.5	1.88	1.66	0.58	-0.27	78	2.5	5.1	3258
HO840003269123009	GENOSOURCE MIDPOINT-ET	INSEME		2305	12.9	69	137	337	79	2.76	6.0	1.8	7.9	1.1	1.56	1.76	0.40	-0.11	78	2.3	4.9	3257
HO840003263337365	PEAK 4020HET	PEAK		2307	12.5	70	155	367	78	2.75	4.7	0.6	6.9	0.2	1.57	1.43	0.46	-0.02	77	2.4	5.3	3257
HO840003272638007	K-S-TAR TRADEMARK-ET	SexTech		2306	12.0	76	138	365	79	2.73	7.6	3.4	7.7	-0.7	1.52	1.33	0.24	-1.53	78	2.5	4.6	3257
HO840003269891305	GENOSOURCE UNITET	SexTech		2309	11.5	78	160	399	79	2.85	4.2	-0.2	5.7	-0.9	1.60	1.64	-0.24	-0.86	76	2.5	4.1	3256
HO840003269127402	GENOSOURCE JIGSAW	SexTech		2302	11.3	82	134	379	81	2.82	5.5	-0.2	5.6	2.0	1.00	1.16	0.31	-1.37	80	2.0	5.2	3255
HO840003269890985	GENOSOURCE DRIZZLE-ET	SexTech	551HO05496	2303	12.0	83	142	403	79	2.96	5.5	1.8	1.5	1.3	0.54	1.15	0.11	-2.11	77	1.6	4.0	3255
HO840003259286221	OCD FUGLEMAN RADICAL-ET	SexTech	551HO05039	2206	11.5	80	111	324	79	2.79	6.7	3.5	5.4	0.2	2.38	2.10	1.24	-0.84	78	2.2	5.5	3254
HO840003263337319	PEAK CHALKINSPIRE-ET	PEAK	011HO16944	2302	11.8	77	137	343	78	2.72	6.3	1.2	8.9	-0.2	1.88	1.11	1.07	1.18	76	2.1	4.4	3254
HO840003247091703	PEN-COL SHEEPSTER 1205-ET	Select		2305	12.0	64	129	338	79	2.81	7.3	3.3	9.6	1.9	1.46	1.55	0.31	-0.58	78	2.4	4.6	3253
HO840003267901952	KENYON-HILL SHEEP ODARKET	Select		2307	11.2	60	133	331	79	2.71	7.1	2.9	9.1	1.6	1.43	1.54	0.91	-0.56	77	2.5	4.5	3253
HO840003254238903	COOKIECUTTER SHEPS 9199DET	Select		2306	11.3	78	140	380	79	2.94	5.4	1.4	6.4	-0.5	1.70	1.90	0.59	-0.75	78	2.5	4.5	3252
HO840003267801970	KENYON-HILL VRSACHI OAKS-ET	Select		2308	11.7	66	126	338	79	2.69	7.4	3.4	9.2	0.8	1.60	1.82	0.44	-1.05	77	2.4	3.9	3252
HO840003272495675	PEAK 8191-ET	PEAK		2309	12.8	78	139	383	79	2.78	6.2	1.8	6.8	1.0	0.86	1.25	0.06	-1.86	77	2.5	5.5	3252
HO840003159305612	JC-KOW 194	Select		2309	11.4	70	140	353	79	2.85	7.2	4.2	8.5	1.4	1.01	0.74	0.72	-0.36	77	2.0	5.2	3251
HO840003267429574	SSI-SIEMERS 43394	Select		2309	11.8	79	112	317	79	2.72	7.2	2.9	9.1	1.3	1.63	1.63	0.88	-0.33	77	2.4	4.4	3251
HO840003275375277	DENOVO 22123 BILLINGS-ET	ABS	029HO21668	2308	12.2	78	141	373	78	2.88	5.6	1.3	3.8	0.1	1.48	1.69	0.15	-0.59	76	1.7	3.5	3251
HO840003259325924	PEAK CASIMIRO-ET	PEAK	001HO19650	2209	12.2	68	100	261	79	2.64	7.4	4.0	10.9	2.2	1.73	2.13	1.33	0.31	78	1.1	4.2	3250
HO840003257391519	LADYS-MANOR SMOKE OWEN-ET	Zoetis	293HO12666	2205	11.2	82	136	349	80	2.71	4.3	-0.5	4.8	-0.1	1.52	1.62	1.24	-0.12	79	2.4	3.6	3249
HO840003269891401	GENOSOURCE YACHTSMAN-ET	SexTech		2310	11.6	85	151	396	79	2.82	5.3	0.9	5.7	-0.1	0.71	1.05	0.09	-1.76	77	2.0	5.2	3249
HO840003244093761	GENOSOURCE BREAKAGE-ET	SexTech	551HO05298	2209	11.9	75	144	385	79	2.91	5.5	1.2	5.0	0.8	1.14	1.47	0.09	-1.54	76	1.7	4.4	3248
HO840003244093041	GENOSOURCE ENDURANCE-ET	SexTech	551HO05246	2211	11.4	80	172	427	79	2.81	5.0	0.7	8.1	-0.4	0.30	0.20	0.16	-1.48	78	2.0	5.6	3248
HO840003247034485	KINGS-RANSOM E DENYME-ET	SexTech		2307	12.4	71	118	341	79	2.60	8.1	2.4	11.4	0.7	1.46	1.56	0.37	-0.74	77	2.0	3.5	3248
HO840003252544104		SexTech		2310	11.3	74	167	391	79	2.83	5.0	1.5	4.1	-0.8	0.91	0.90	0.90	-0.25	77	2.1	4.4	3248
HO840003269404968	PEAK 8751I-ET	PEAK		2307	12.3	78	160	396	79	2.76	5.1	1.4	6.3	-0.8	0.85	1.15	0.39	-0.76	77	2.6	5.6	3247
HO840003269890813	GENOSOURCE BREAKTIME-ET	SexTech		2305	11.6	74	142	369	79	2.93	5.0	1.2	7.3	1.6	0.82	1.41	-0.05	-0.76	78	1.4	3.4	3247
HO840003252544094		SexTech		2310	11.2	74	161	395	79	2.99	4.3	0.5	1.3	0.7	1.08	1.15	0.27	-0.60	77	1.8	4.1	3246
HO840003244093934	DELICIOUS DURATION-ET	SexTech	551HO05245	2211	11.3	63	127	353	79	2.85	7.0	3.1	7.9	2.2	0.99	1.81	0.23	-0.47	76	1.6	4.3	3245
HO840003265763319		Select		2308	11.7	68	132	336	79	2.85	5.9	3.1	7.1	-0.3	2.22	2.26	0.98	0.09	77	2.8	4.7	3245
HO840003244027411	GENOSOURCE JAYLON-ET	SexTech	551HO05302	2209	11.2	73	146	376	81	2.80	5.1	1.0	5.0	0.6	1.49	1.36	0.63	-1.30	80	2.5	6.5	3244
HO840003263438351	PEAK 2628-ET	PEAK		2307	12.6	78	143	380	78	2.94	4.1	-0.5	2.5	-0.2	2.03	2.24	0.47	-0.62	77	2.8	5.8	3244
HO840003267429995	SSI-SIEMERS 43805	Select		2310	11.8	75	126	353	79	2.82	6.5	2.1	7.3	1.2	1.64	1.37	0.58	-0.52	78	2.2	5.3	3244
HO840003269404443	PEAK PRIMERHET	PEAK		2303	12.6	67	121	330	78	2.45	7.3	2.3	11.3	-0.6	2.00	2.06	1.22	-0.30	76	3.0	5.6	3244
HO840003269893535	GENOSOURCE DOMINO-ET	INSEME		2306	11.8	83	128	365	79	2.97	5.3	1.1	4.1	1.3	1.55	1.35	0.36	-1.02	78	1.4	4.1	3244
HO840003269893970	GENOSOURCE MEGALADON-ET	SexTech		2310	10.9	70	145	371	81	2.86	4.5	0.2	6.0	0.5	1.48	1.65	0.95	-1.74	80	1.6	4.9	3244
HO840003269890965	GENOSOURCE MIDIGATE-ET	INSEME		2306	11.9	79	140	372	79	2.88	5.1	1.2	5.9	-0.3	1.61	1.91	0.16	-1.04	78	2.1	4.8	3243
HO840003272391891	Zoetis			2310	10.5	78	131	365	80	2.77	6.0	2.7	6.9	0.3	0.88	1.79	0.49	-1.95	79	2.3	4.7	3243
HO840003269899915	GENOSOURCE ELLISON-ET	SexTech	551HO04958	2203	11.4	86	147	399	81	2.91	3.8	-0.9	-0.9	-0.9	1.57	1.60	0.60	-1.74	80	1.7	5.5	3241
HO840003261833118	SSI-DUCKETT 6097	Select		2305	11.8	70	131	347	79	2.79	7.4	3.2	7.9	0.2	1.61	1.58	0.70	-0.71	78	2.5	4.5	3241
HO840003252559274	S-S-I EARLYBIRD SUNDANCE-ET	Select	007HO16485	2205	11.3	53	106	270	79	2.52	8.6	4.6	11.1	2.8	1.76	2.25	0.04	-0.78	78	1.5	3.8	3240
HO840003257573226	SANDY-VALLEY 40126	Select		2212	11.2	67	153	386	79	2.72	5.4	-0.1	5.6	-1.5	1.89	2.11	0.74	-1.75	78	2.3	5.5	3240
HO840003269894016		SexTech		2310	11.2	88	125	362	80	2.74	5.1	-0.7	5.9	-1.4	2.39	2.19	0.75	-1.13	79	2.5	5.5	3240
HO840003250769326	SANDY-VALLEY ESCAPATIVE-ET	Semex	293HO12861	2211	11.6	63	131	341	79	2.65	6.1	1.7	7.2	0.6	1.47	2.26	0.72	-1.51	78	2.4	4.6	3239
HO840003260127366		SexTech		2302	11.8	75	135	357	81	2.82	5.9	0.4	7.5	0.5	1.33	1.94	0.38	-1.20	79	1.9	5.7	3239
HO840003269891025	GENOSOURCE BELLHOP-ET	SexTech		2307	11.2	77	142	382	79	2.95	5.5	0.8	5.4	1.7	0.92	0.96	-0.09	-1.52	76	1.3	4.2	3239
HO840003269891359		SexTech		2310	12.3	78	123	325	78	2.78	6.1	2.6	6.1	0.5	1.85	1.58	0.89	0.46	77	1.8	4.5	3238
HO840003269891411	GENOSOURCE JORIAN-ET	SexTech		2310	12.1	86	145	417	79	3.04	5.5	1.3	3.3	1.4	0.39	0.88	-0.61	-0.77	77	1.7	4.6	3238
HO840003269894047	GENOSOURCE SMOKESHOW-ET	SexTech		2311	11.6	81	124	359	79	2.75	6.3	1.3	5.4	-0.1	1.58	1.88	0.57	-1.23	78	2.5	4.4	3238
HO840003252567390	PINE-TREE OLLY-ET	HO		2305	12.3	56	132	353	78	2.63	7.8	4.6	10.8	1.9	0.59	1.33	0.30	-1.41	77	2.1	4.4	3237
HO840003012575604		SexTech		2310	11.8	86	154	419	79	2.92	5.3	0.7	2.5	-0.3	0.86	0.84	-0.12	-1.82	77	1.9	4.7	3236
HO840003257573143	SANDY-VALLEY SATURDAY-ET	Semex	200HO12863	2211	11.4	75	149	375	79	2.69	4.0	-0.8	5.6	-2.0	2.25	2.06	0.87	-0.33	78	2.3	4.8	3236
HO840003260763678		Select		2310	11.4	72	140	325	78	2.79	4.7	-2.0	5.2	-0.1	2.36	2.07	1.05	1.08	77	2.6	4.1	3236
HO840003220964888	CLEAR-ECHO PERKY 1936-ET	Semex		2309	11.4	62	127	301	76	2.53	6.9	0.9	8.3	1.0	1.86	2.10	0.43	-0.38	74	1.9	4.6	3235
HO840003244093783		SexTech		2310	11.6	76	135	372	80	2.90	4.8	1.5	3.9	0.9	1.50	1.60	0.26	-1.53	78	2.3	4.2	3235
HO840003257574274	SANDY-VALLEY MOODYBOOMET	Semex		2303	11.2	63	144	357	77	2.57	5.6	0.2	6.5	0.1	1.57	1.74	0.49	-1.09	75	2.3	4.0	3235
HO840003260127133	GENOSOURCE DRUMROLL-ET	SexTech	551HO05397	2212	11.4	78	116	304	80	2.88	4.4	0.5	4.9	-1.3	2.82	3.18	1.86	-0.62	79	2.0	5.2	3235
HO840003271293857	OCD SHEEPSTER EARNESTET	Select		2306	11.7	74	125	335	79	2.69	7.3	2.9	9.2	0.9	1.42	1.18	0.54	-0.31	78	3.1	4.5	3235
HO840003269893765	GENOSOURCE MORRIE-ET	INSEME		2308	12.6	69	141	365	79	2.85	5.6	0.7	6.7	0.8	1.14	1.56	0.74	-1.40	78	1.9	4.4	3234
HO840003252119874	PEAK EXCITEMENTET	PEAK	001HO19675	2210	11.9	69	118	312	79	2.70	7.0	2.4	10.7	1.1	1.89	1.58	1.53	-0.35	78	1.6	4.7	3233
HO840003253835518	BEYOND LETCHWORTH GIANTET	Select	007HO16935	2212	10.9	57	145	350	79	2.75	5.7	0.2	6.9	0.2	1.84	1.97	0.73	-1.10	78	1.5	3.1	3233
HO840003260127422	SIEMERS DANISHET	Select		2302	11.6	75	120	338	81	2.84	6.0	1.7	5.5	1.5	1.42	1.65	0.98	-1.15	80	2.0	4.4	3233
HO840003267429145	SSI-SIEMERS 42955	Select		2308	12.0	63	113	310	78	2.69	6.4	-0.3	6.8	1.6	2.42	2.53	0.67	-0.85	77	1.6	4.5	3233
HO840003267429564	SSI-SIEMERS 43374	Select		2309	11.8	66	129	315	78	2.63	5.8	-0.1	8.8	1.0	2.02	1.91	0.29	-0.13	77	1.7	4.0	3233
HOCAN000014260000	PROGENESIS ACHIEVE 7993	Semex	200HO13015	2304	11.9	77	134	379	78	2.66	6.2	1.6	9.4	-0.4	1.13	1.71	0.06	-1.10	77	2.7	5.4	3233
HO840003252543927	551HO05776	SexTech		2309	11.8	71	148	376	79	2.84	5.2	1.0	4.9	0.6	1.17	1.03	0.69	-1.03	78	1.7	4.1	3232

What is a SNP genotype worth?

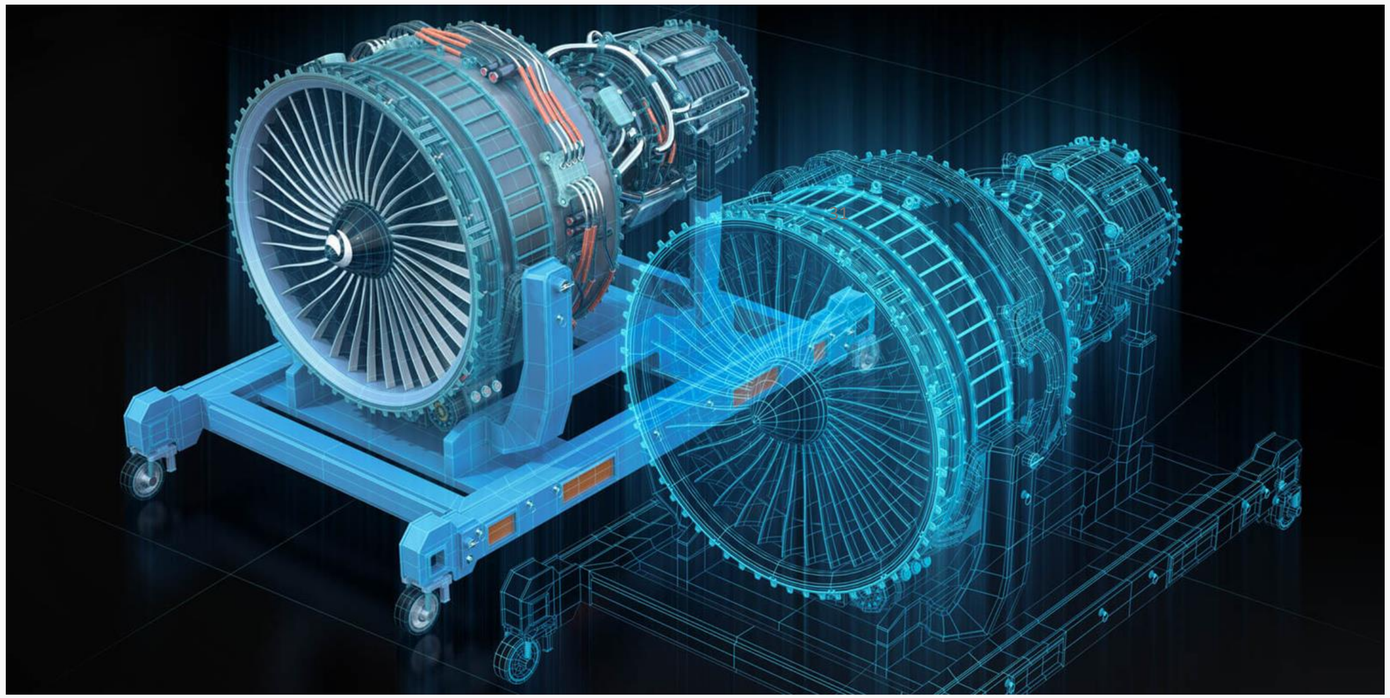
And for daughter pregnancy rate (h^2=0.04), SNP = 131 daughters

STgen Inc.

What is a Genetic Twin?

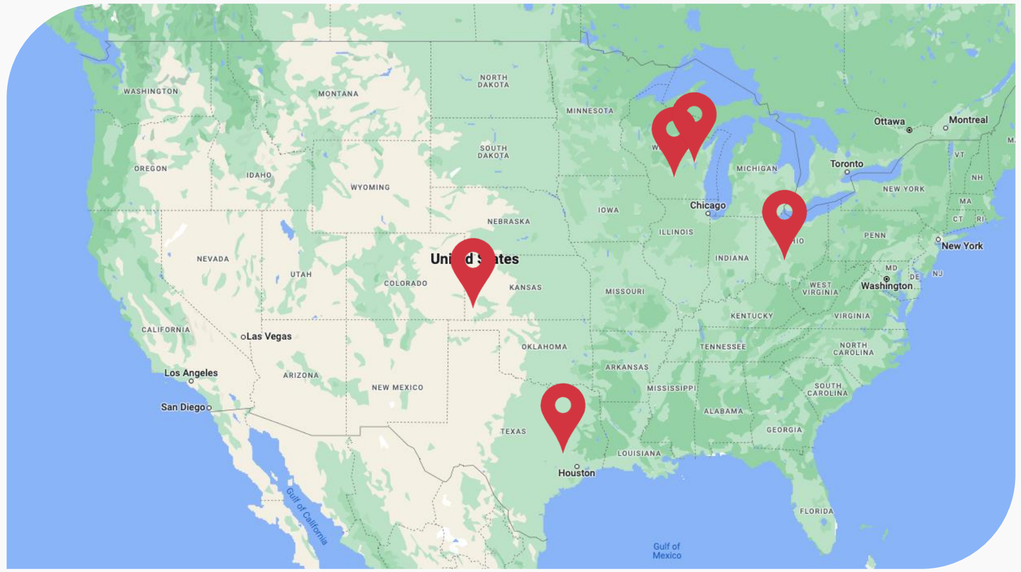
It helps in predicting, optimizing, and improving decision making.

It has revolutionized the industrial world, particularly the manufacturing industry, construction and healthcare sector, smart cities, and energy industry.



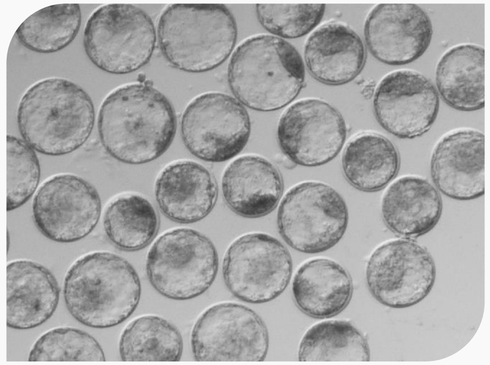
STgen Inc.

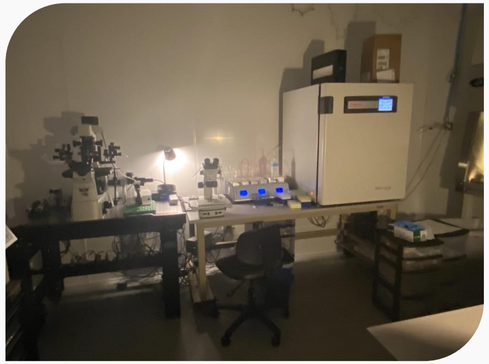
Intensive use of ARTs in our internal genetic development program



- >60,000 IVP embryos transferred yearly
- ~1,500 SCNT embryos production capacity

- OHC: MOET, OPU, IVP, ET, Amnio, JIVET, SCNT, ESC
- Vienna Farms: SCNT, ESC
- Navasota ET lab: MOET, OPU, IVP, ET
- Syracuse recipient farms: ET



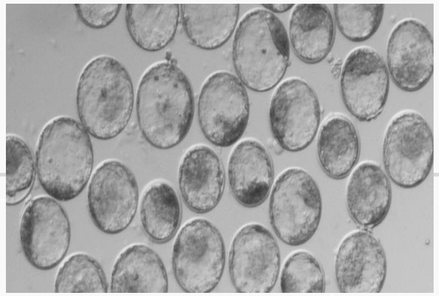


GeneticVisions - ST™

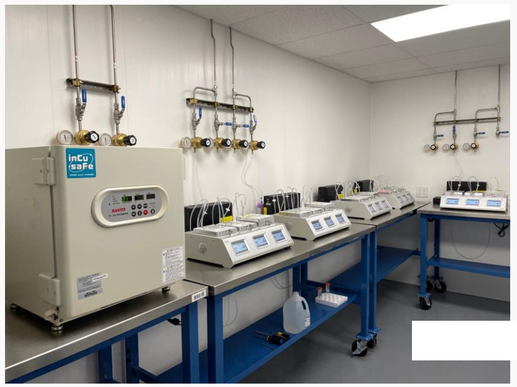
STgen Inc.

CHROMOSOMAL® MATING

OHC New IVF laboratory - Q1-Q2 2023 Results



	OPUs	Oocytes	Cleaved embryos	Cleavage %	Embryos produced	Embryo production %	Embryos/ donor
Male development	467	7,078	5,358	76%	2,872	41%	**6.1**
Female base	999	14,537	9524	66%	6,028	41%	**6.0**
JIVET	154	6,665	4,000	60%	1,578	24%	**10.2**
Total	1,658	28,708	19,249	67%	**10,675**	28%	**6.4**



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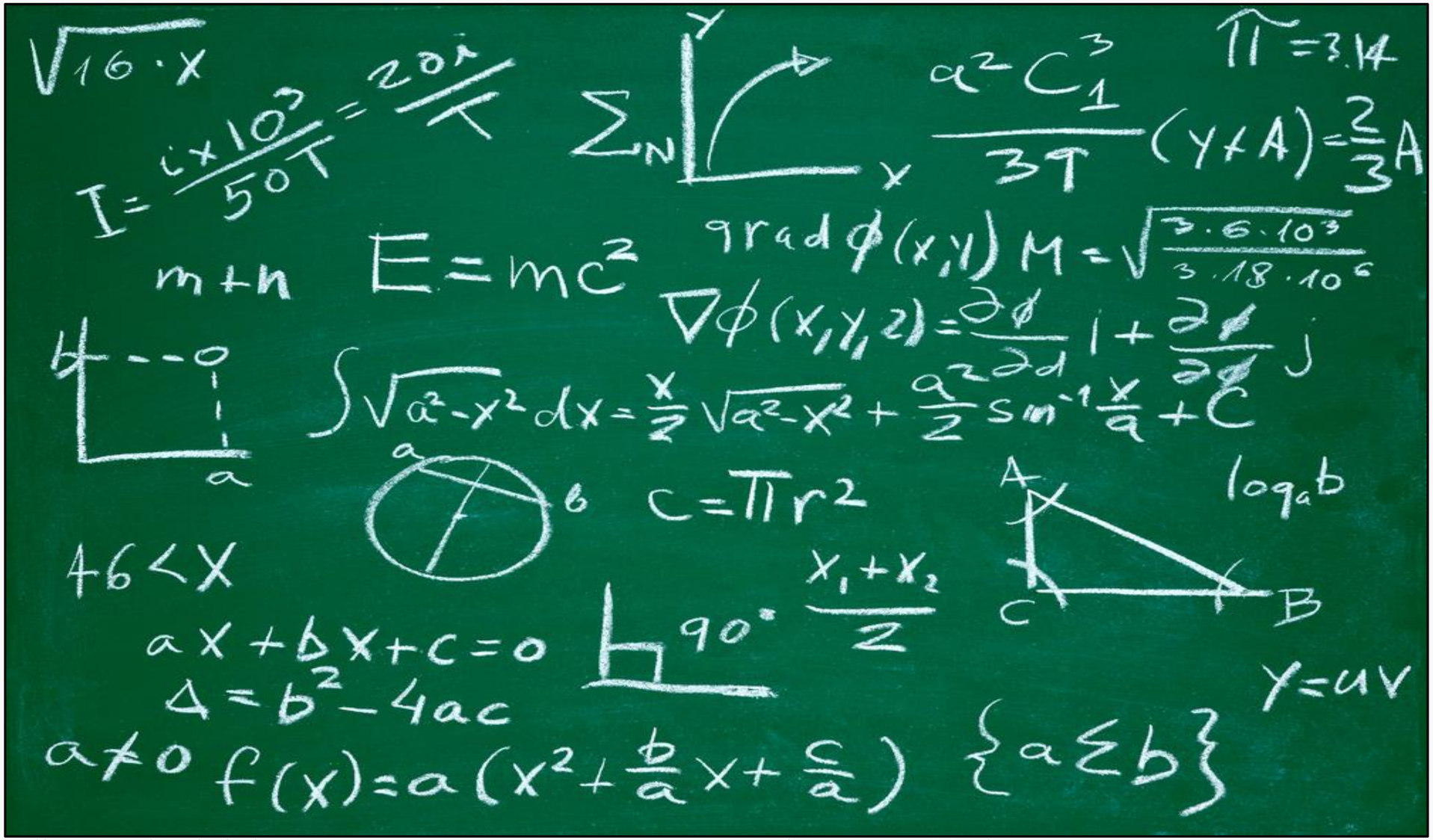
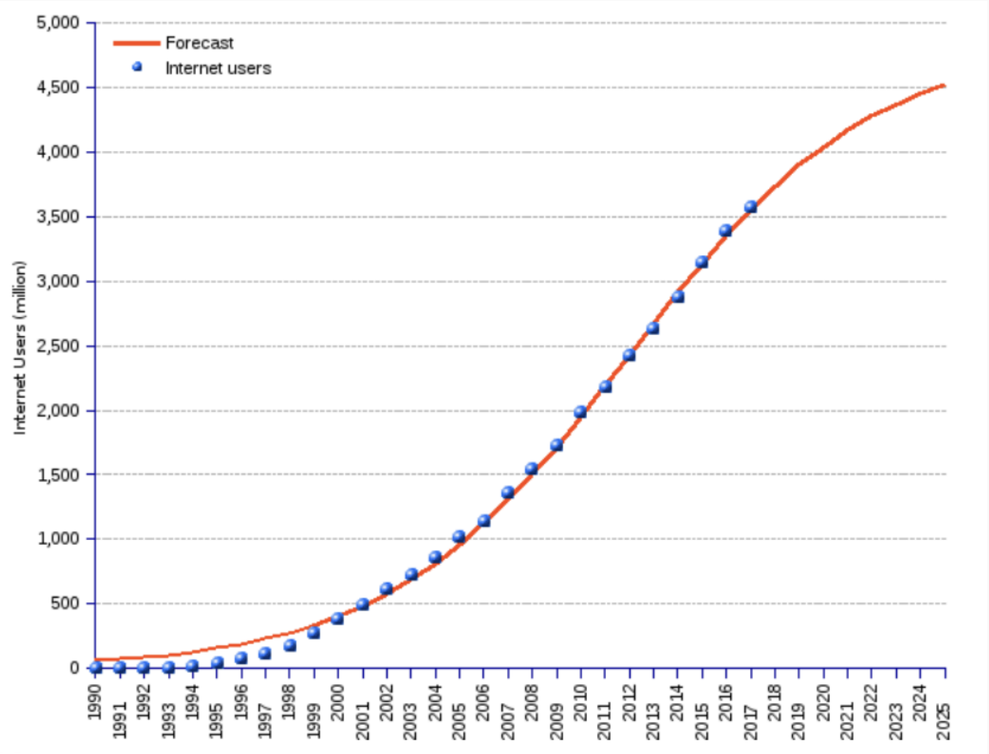
BIO-ELECTRONICS



http://gigaom.com/2012/05/31/t-mobile-pits-its-math-against-verizons-the-loser-common-sense/shutterstock_76826245/

Half the world is online & many have smart devices

- In 1990, before the first internet browser was released, less than 0.5% of the world's population was online. By 2020, more than half of the world's population used the internet.
- In 2020, it was estimated that almost 30 billion smart devices were connected via the internet.

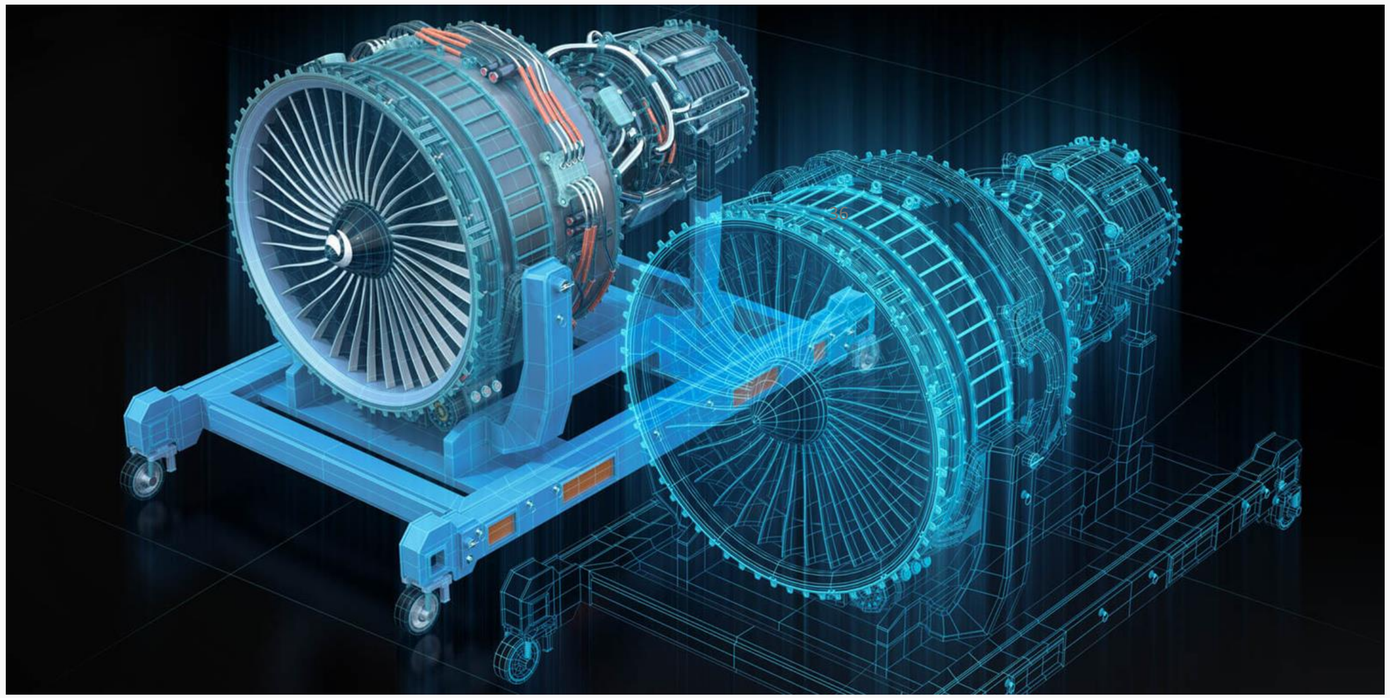


30 B/4 B = 7.5 smart devices/person

What is a Biosensor Twin?

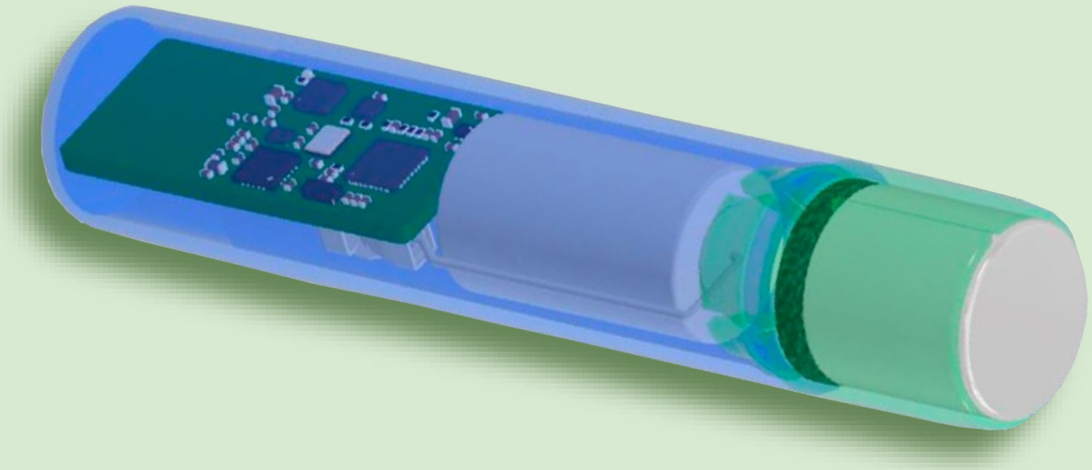
It helps in predicting, optimizing, and improving decision making.

It has revolutionized the industrial world, particularly the manufacturing industry, construction and healthcare sector, smart cities, and energy industry.



STgen Inc.

Farmfit®



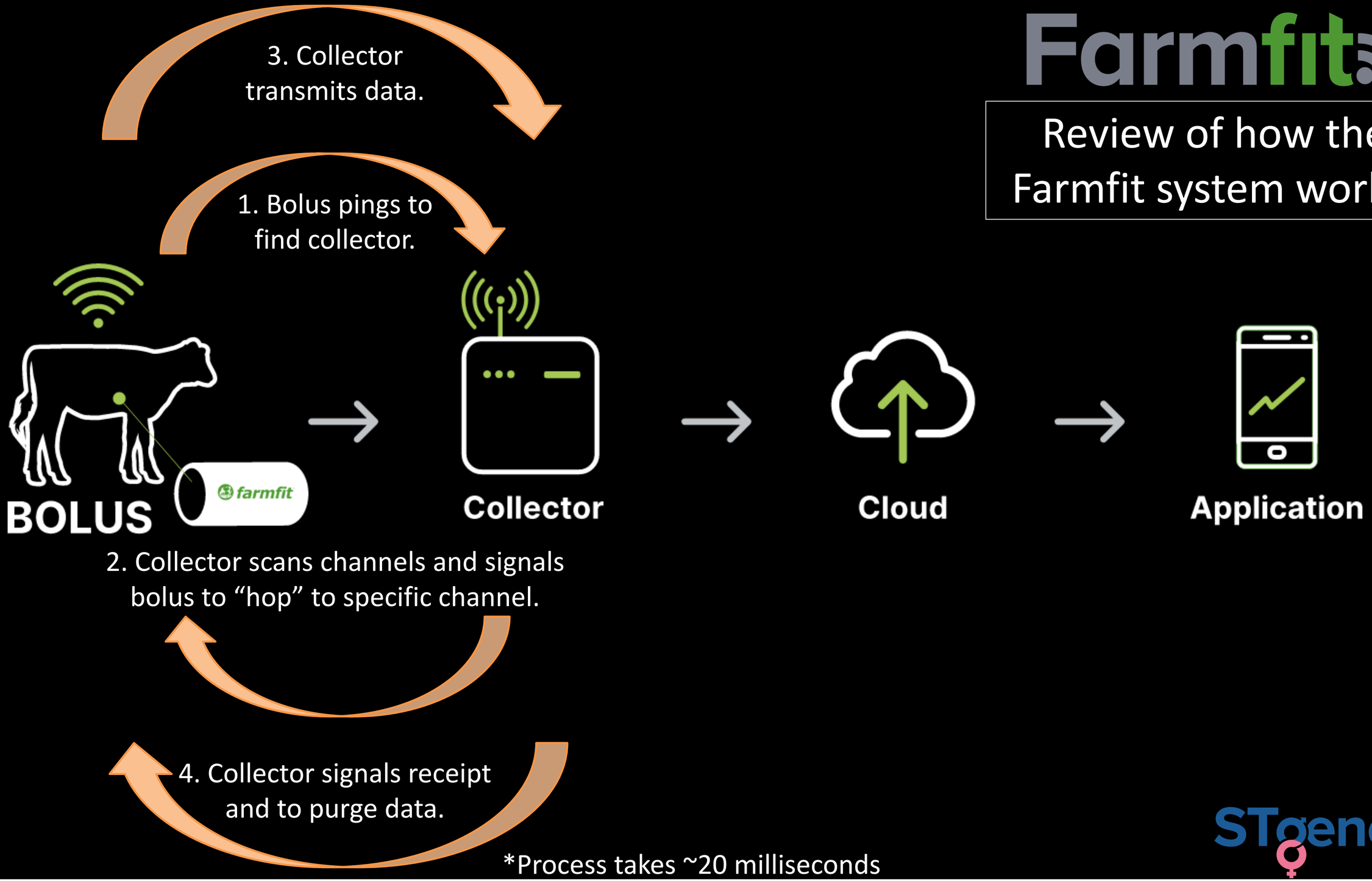
“Cradle to Grave” design enables value creation across lifetime of animal

- **Calf sized** unit
- **5 Year Battery**
- One product for **both calves and cows**
- **Magnet included**
- **Temperature** and **Activity**
- Designed specifically for **automated assembly of product**

STgen Inc.

Farmfit®

Review of how the Farmfit system works.



*Process takes ~20 milliseconds

STgenetics®

Farmfit benefits to users

- **Health Monitoring** for All Individual Animals
- Full **Traceability** from Birth
- **Labor Optimization**

We are saving lives!

STgen Inc.

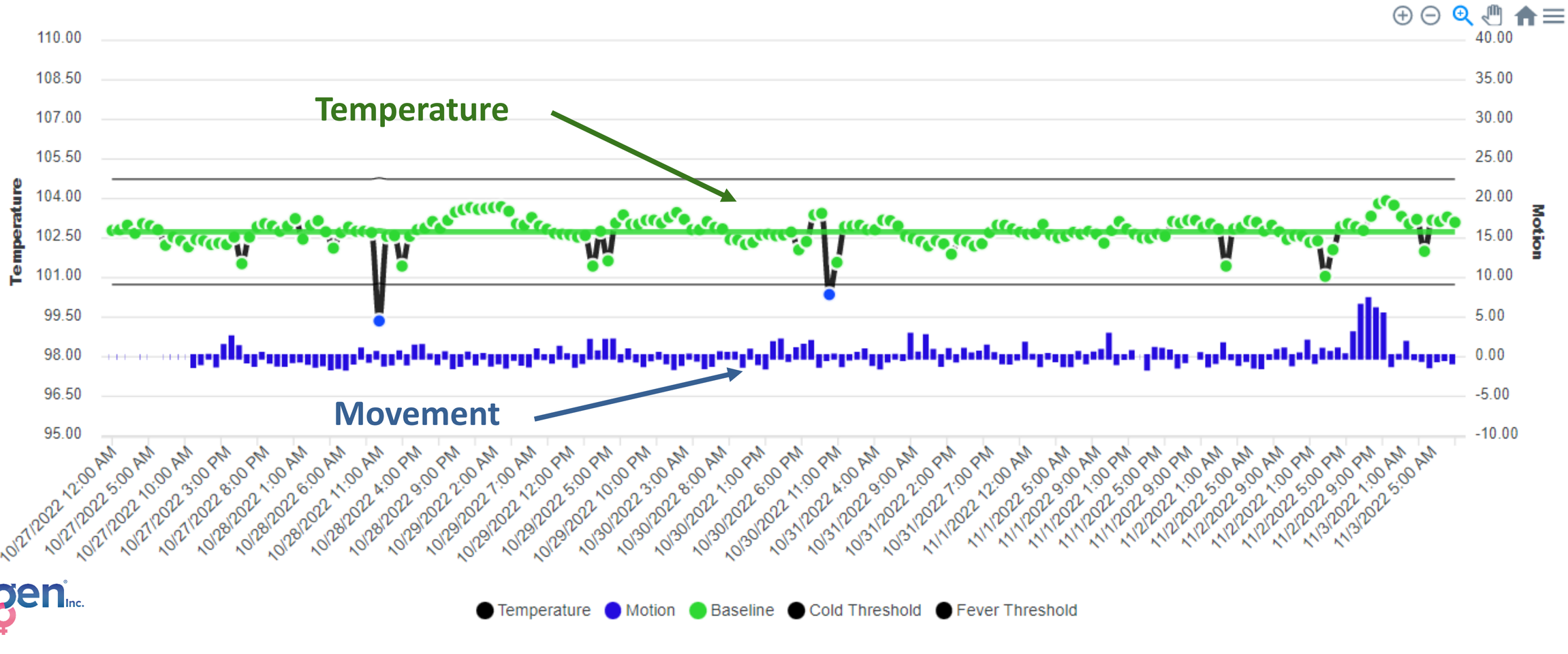
Animal Information

Ear Tag: 98836 | Barn: Auto Barn North | Pen: 551 | Breed: HO | Calf | Active

General | Weight | Health | Birth Information | Reproduction | Physical Exam | Pen History | Animal Timeline

Last Week

Last 24 h | Last 72 h | Week | Month | Interval



STgen Inc.

General | Weight | Health | Birth Information | Reproduction | Physical Exam | Pen History | Animal Timeline

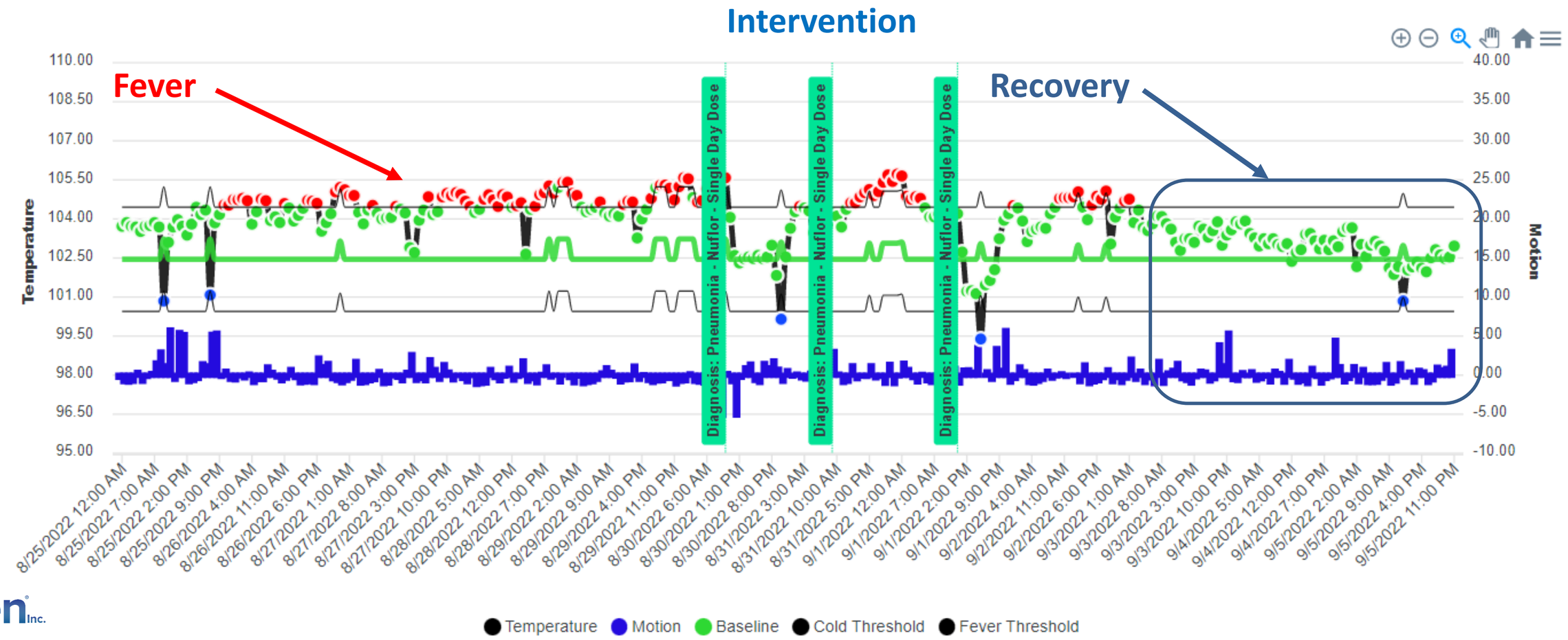
Interval

Last 24 h | Last 72 h | Week | Month | Interval

Date From: 8/25/2022

Date To: 9/5/2022

Search



STgen Inc.

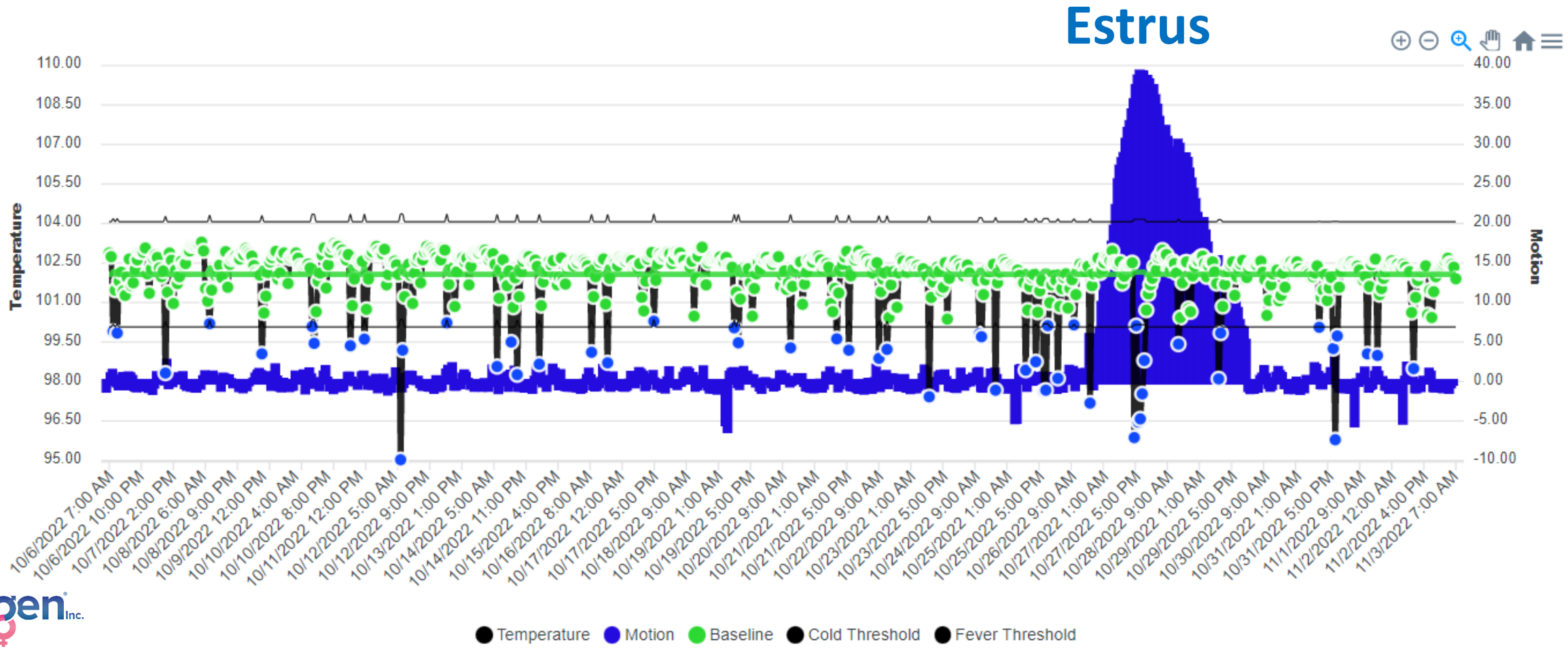
Animal Information

Ear Tag: 18736 | Barn: Barn 1 | Pen: 127 | Breed: HO | Heifer | Active

General | Weight | Health | Birth Information | Reproduction | Physical Exam | Pen History | Animal Timeline

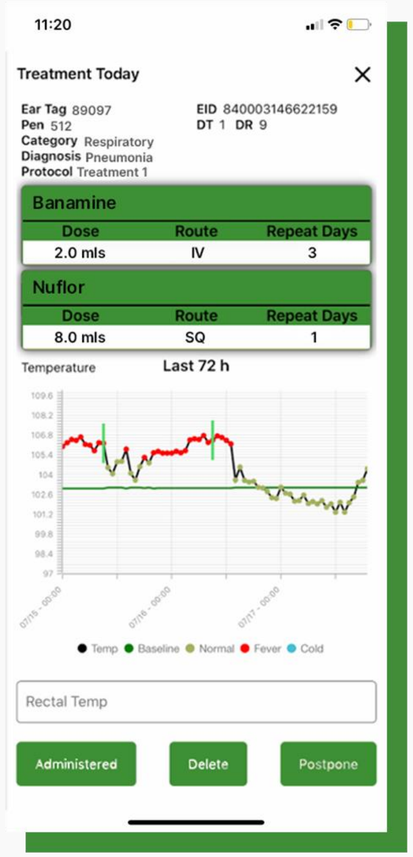
Last Month

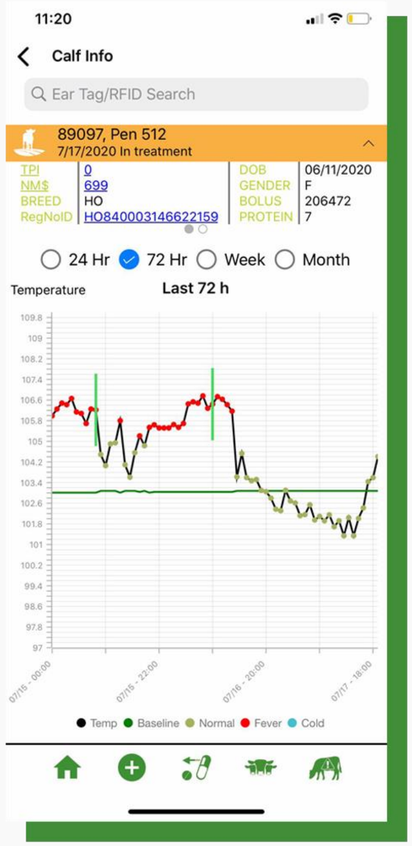
Last 24 h | Last 72 h | Week | Month | Interval

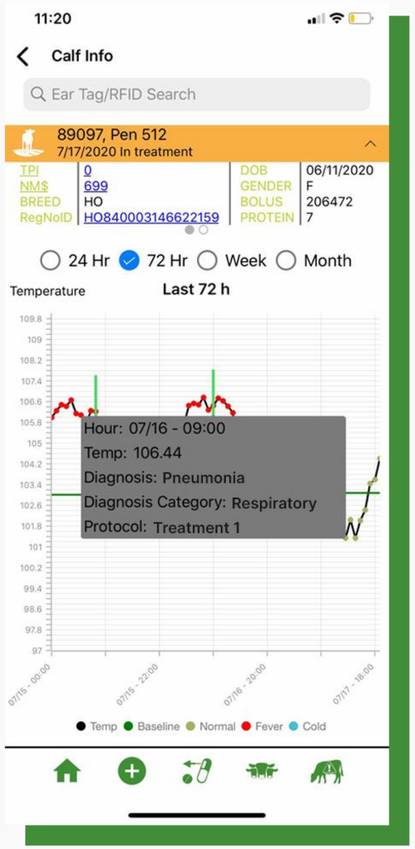


STgen Inc.

Response to treatment

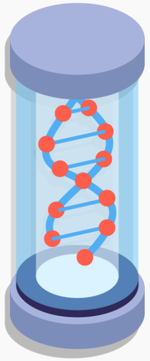






Getting food from the farm to your table.

GENETICS SUPPLY



DAY 1

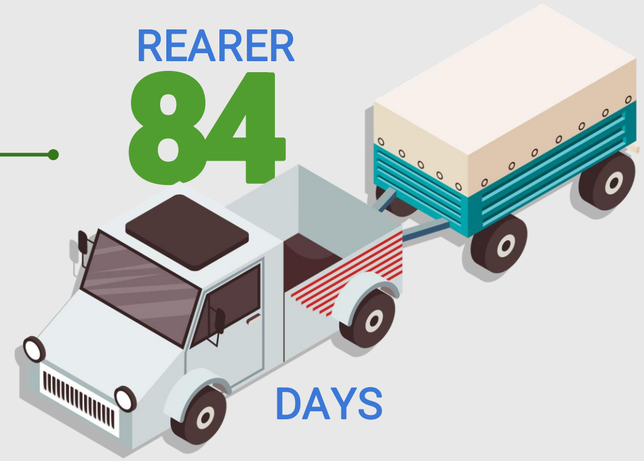
INSEMINATION

Industry leading selection identifying the very best genetics

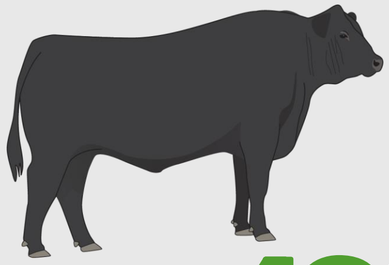
282 DAYS PREGNANCY

CALF MOVED TO REARER TO 10-35 DAYS AFTER BIRTH

REARER 84 DAYS



FINISHING UNIT FOR 433 DAYS



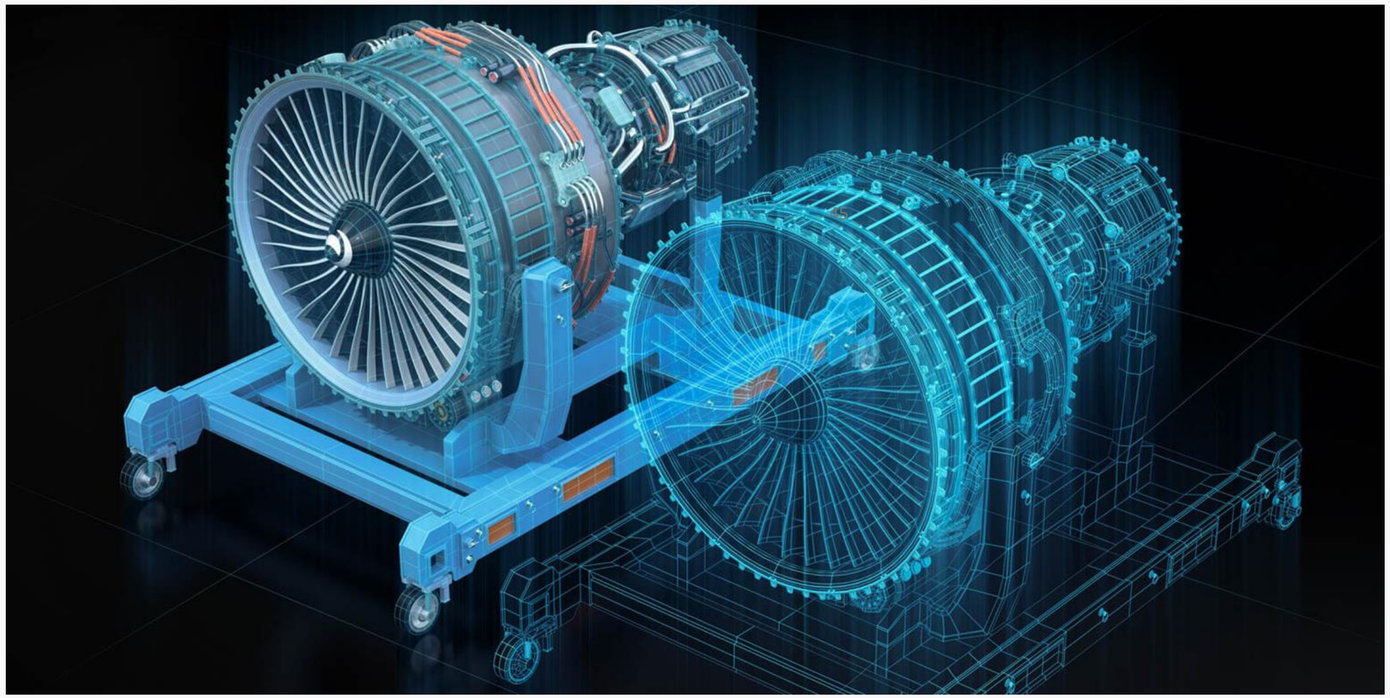
100% SUPERMARKET SHELF

Consistently high quality beef that's lifetime farm assured with a lower, more transparent hoofprint

What is a Phenotyping Twin for Selection of new traits?

It helps in predicting, optimizing, and improving decision making.

It has revolutionized the industrial world, particularly the manufacturing industry, construction and healthcare sector, smart cities, and energy industry.



STgen Inc.

Ecofeed®

EXTRAORDINARY TIMES REQUIRE, **EXTRAORDINARY** MEASURES

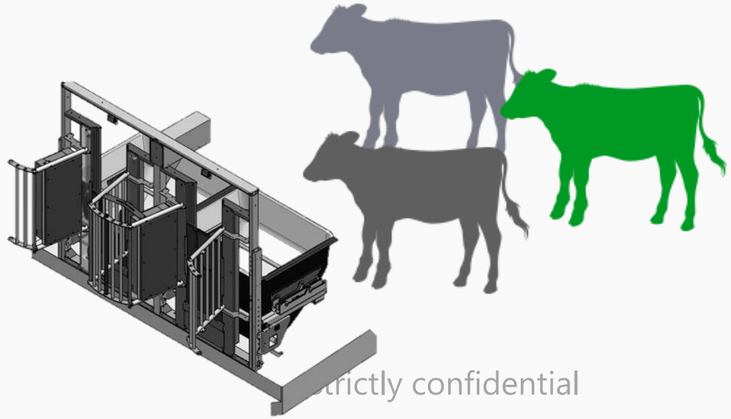
The genetic fingerprint of efficient feed conversion

Dr. Jocelyn Johnson
Animal Research Scientist STgenetics®

How did we develop Ecofeed® ?

STgenetics

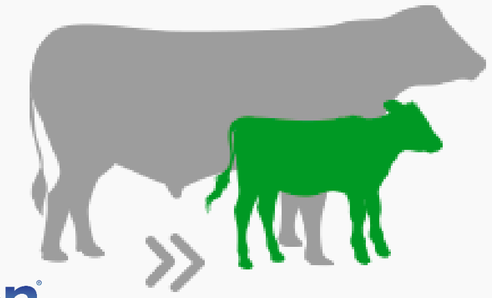
1 Build large scale phenotyping system



2 Collect DNA and genomic test all animals

3 Collect Progeny Data

- ✓ Intake
- ✓ Performance
- ✓ Reproduction



4 Run genetic analysis

5 Create Genetic Selection Indexes

Ecofeed® heifer

Ecofeed® cow

Ecofeed® beef on dairy

STgen Inc.

STgenetics is using the most advanced technology for phenotyping

ST research facilities equipped with:

- ✓ >500 feed bunks
- ✓ 160 3-D cameras
- ✓ 10 GreenFeed units
- ✓ 16 Lely milk robots
- ✓ Lely calf feeders
- ✓ DNA testing lab

Individual Feed Intake

Daily Body Weight Cameras

Methane Emissions

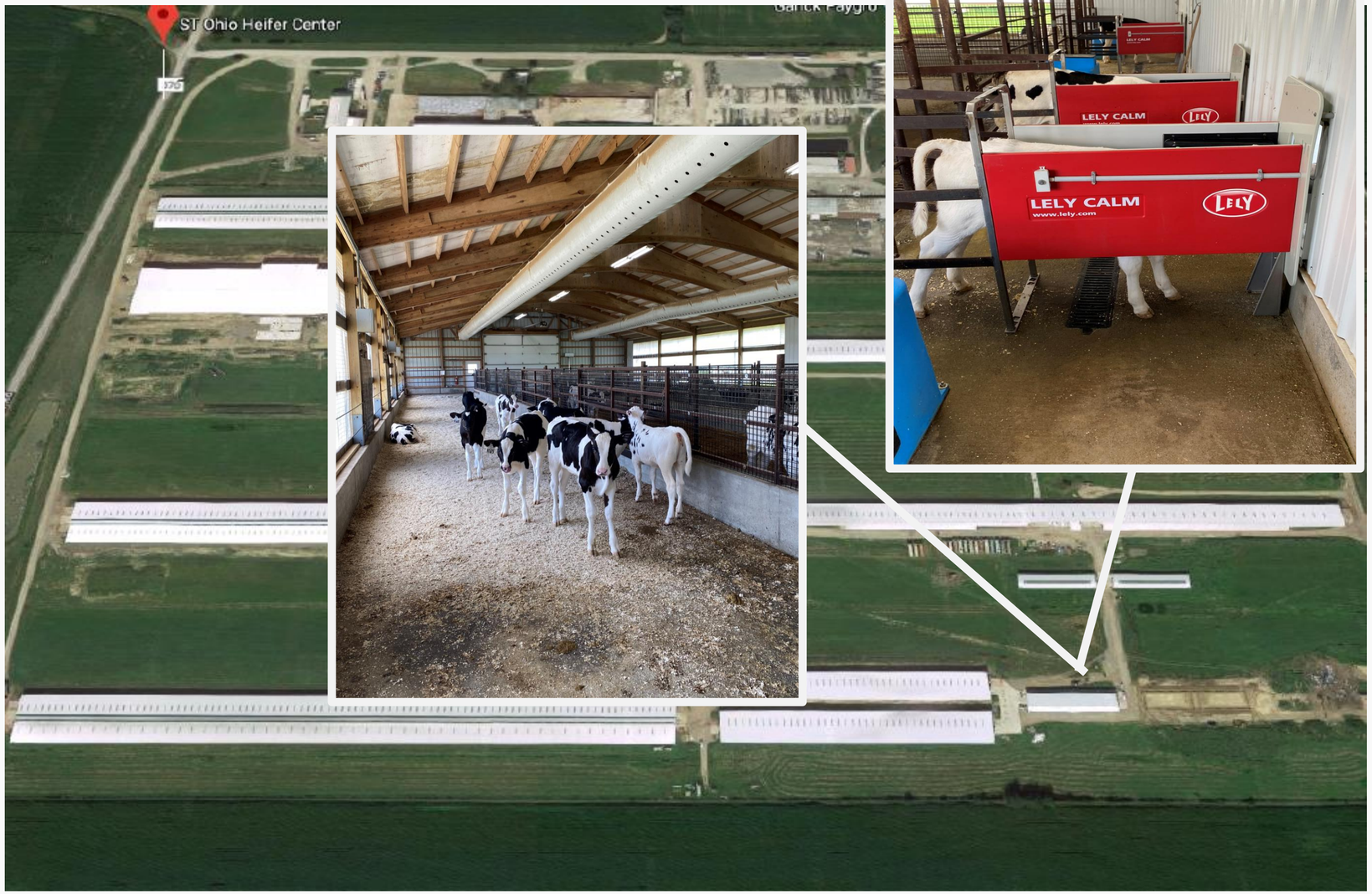
Robotic Milk Machines

Genomic Testing Lab

Ecofeed ®

Ohio Heifer Center

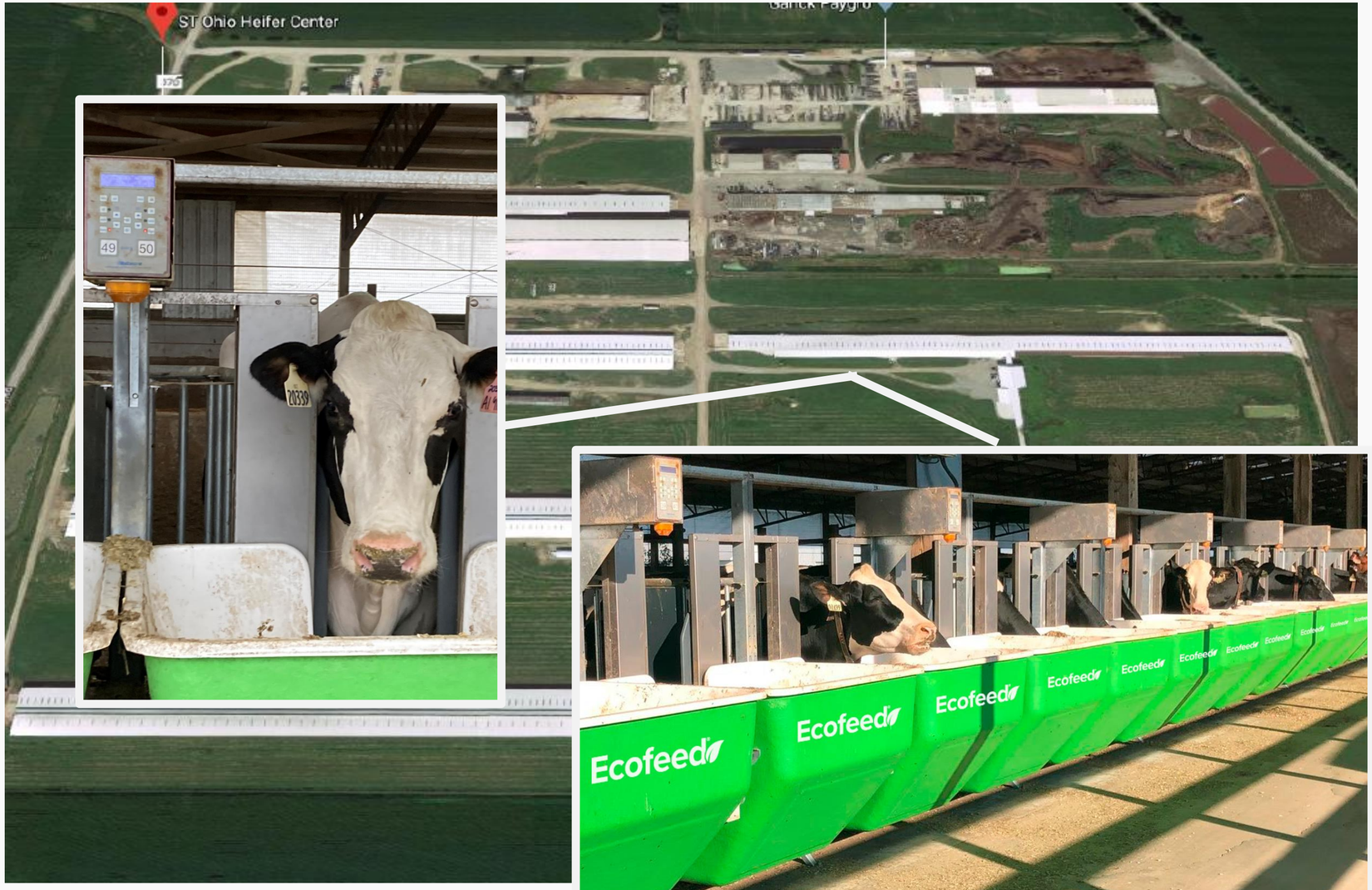
- ✓ Calf Auto Barn



Ecofeed®

Ohio Heifer Center

- ✓ Calf Auto Barn
- ✓ Growing HO heifer feed conversion barn
- ✓ Parlor milk barn with feed conversion test



STgen Inc.

Ecofeed®

Ohio Heifer Center

- ✓ Calf Auto Barn
- ✓ Growing HO heifer feed conversion barn
- ✓ Parlor milk barn with feed conversion test
- ✓ Lely robotic milking barn with feed conversion test

Ecofeed®

Genetic Development Center

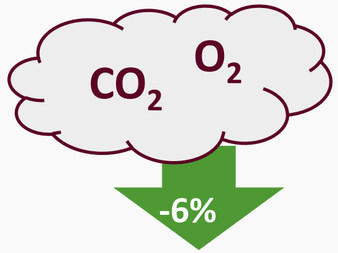
- ✓ 1,280 One-time capacity
- ✓ 5,000 BxD tested per year
- ✓ 160 electronic feed intake bunks
- ✓ 20 pens
- ✓ Temple Grandin working facility

Ecofeed® environmental implications

Texas A&M collaborative study to directly measure methane production in heifers with divergent genomic Ecofeed

- ✓ 54 HO heifers
- ✓ Divergent genomic heifer Ecofeed
- ✓ Individual feed intake and methane emissions measured

Group	Low Ecofeed Heifer	High Ecofeed Heifer
N	*27*	*27*
Ecofeed®	93	109
DMI, lb/d	23.1	21.4 -1.7
ADG, lb/d	2.4	2.3
Methane, g/d	221	204 -7.7%



AgriLIFE RESEARCH
Texas A&M System

STgen Inc.

The data behind Ecofeed®

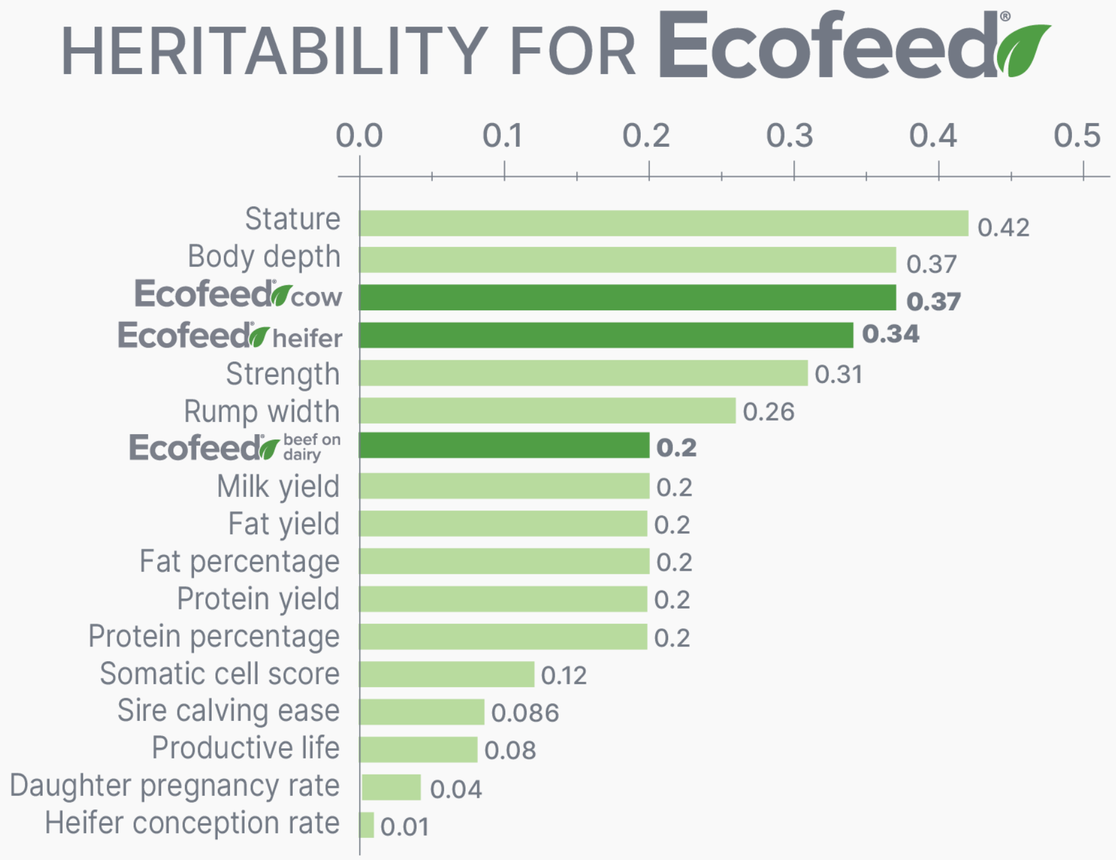
Data Points	Holstein Heifers	Holstein Cows	BxD Calves
Start of feed efficiency testing	2014	2020	2019
# of daily intake records collected	>800k	>400k	>750k
# of BW records collected	>40k	>400k	>50k
# of feed conversion phenotypes collected	8,184	2,136	7,045

Largest feed conversion efficiency database of a single operation to date

Allows for genomic predictions of related animals with **high accuracy**

*Residual feed intake used to define feed conversion

Impact of Ecofeed® on the next generation



Correlation of Ecofeed® genomic breeding values with production traits

Trait	Ecofeed heif	Ecofeed cow
Total Performance Index (TPI)	-0.10	0.16
Net Merit ($NM)	0.00	0.18
Milk	-0.05	0.04
Protein	-0.05	0.06
Fat	-0.02	0.11
Productive Life	0.04	0.18
Daughter pregnancy rate (DPR)	0.04	0.01
EcoFeed Heifer	---	0.19
EcoFeed Cow	0.19	---

Source CDCB & HAUSA (08/23) | Source for EcoFeed® Sexing Technologies®

Selection for **High EcoFeed®** females can be done with the same **confidence** as selection for other economically relevant traits as it has similar heritability

Ecofeed® increases environmental sustainability

STgenetics

Less Land

Less fertilizer & pesticide use

Less water

Less energy to irrigate crops

Less fossil fuels for tractors & other farm equipment

15% Less **feed** Consumed*

21% Less **water** ingested*

15% Less **methane** emitted*

STgen Inc.

AgriLIFE RESEARCH Texas A&M System

UCDAVIS

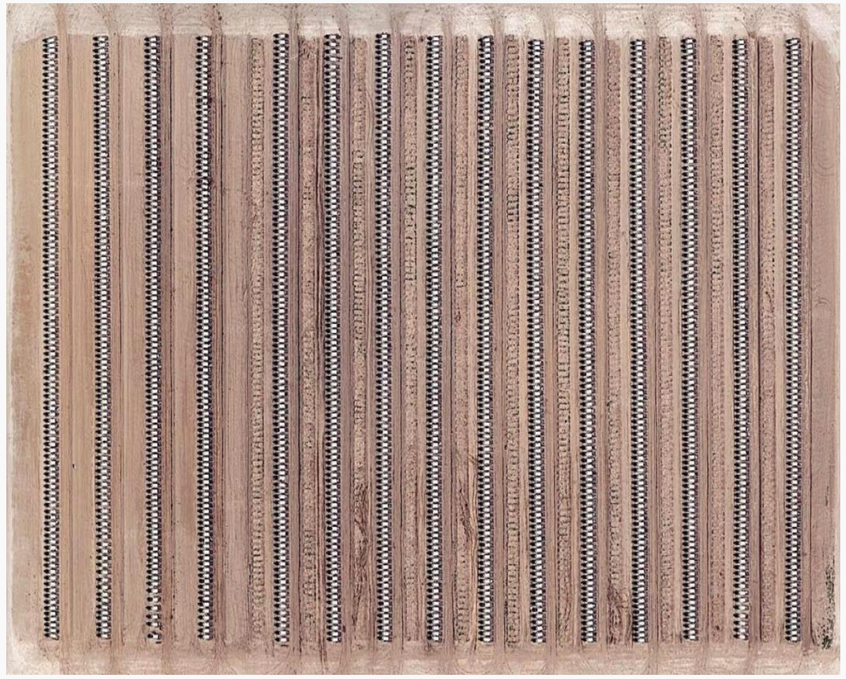
Impact of Ecofeed® sire selection on feed cost and CO_2 savings

Bull*	TPI	Ecofeed Heifer	Ecofeed Cow	Feed Cost Savings	Kg CO_2 Savings*
1	3093	107	133	$ 290	476
2	3057	108	129	$ 262	434
3	2999	99	131	$ 244	386
4	3018	98	130	$ 229	359
5	2970	99	128	$ 224	355
6	2944	97	129	$ 223	348
7	3010	104	124	$ 209	342
8	3030	98	127	$ 213	335
9	3021	105	123	$ 204	334

**Each bull represents a top ranking sire with semen available through STgenetics; Kg CO2 savings per daughter based on Ecofeed changes in the 1st generation, $0.13/lb DM heifer and $0.19/lb DM cow ration cost*


Food and Agriculture
Organization of the
United Nations
E-AGRICULTURE IN ACTION:
BLOCKCHAIN
FOR AGRICULTURE
Opportunities and Challenges

BEEF ON DAIRY THE ULTIMATE UNIFORMITY



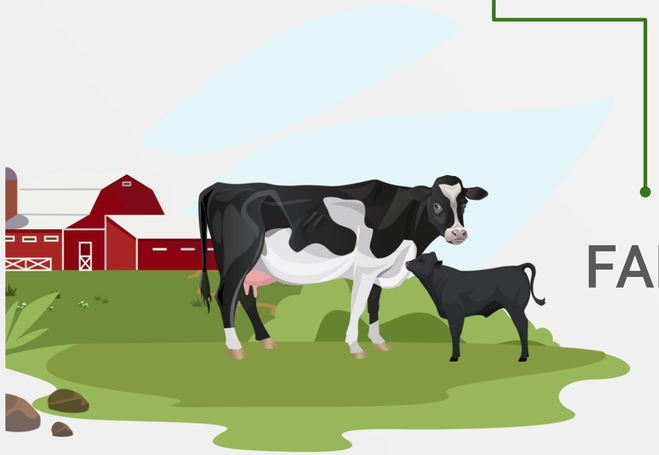
Traceability

NURSERY

- Weight
- Milk intake
- Feed intake
- Treatments
- Vaccinations

POINT OF SALE

- Co-mingling
- Feed
- Interventions

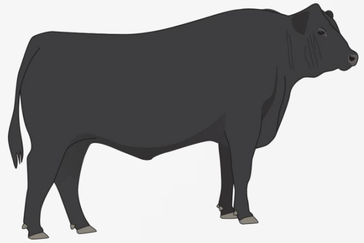


FARM

- Location
- Date of birth
- Sire/Dam
- Weight
- Colostrum
- Genomics

RANCH

- Feed
- Weight
- Vaccinations
- Treatments



FEEDLOT

- Feed
- Weight
- Vaccinations
- Treatments

DISTRIBUTION

- REA
- YG
- Marbling
- Color
- Coat color

STgenetics

Beef ADD ON™ VALUE OF GENDER

Performance differences between steers (n = 1605) and heifers (n = 1375)

Steer

- ADG = **3.25** lbs/d
- DMI = **23.8** lbs/d
- FCR = **7.32** lbs/lb
- Cost of gain = **$0.88**
  ($0.12/lb DM)
- Cost of gain = **$1.46**
  ($0.20/lb DM)

+14%

-6%

Heifer

- ADG = **2.84** lbs/d
- DMI = **22.1** lbs/d
- FCR = **7.78** lbs/lb
- Cost of gain = **$0.93**
  ($0.12/lb DM)
- Cost of gain = **$1.56**
  ($0.20/lb DM)

STgen Inc.

PROFITABLE SUSTAINABILITY of Beef X Dairy Cattle IS PREDICTABLE WITH

NEW

Genomic testing

- High Average Daily Gain
- High Feed Efficiency
- HIGH MARBLING
- Verifeid Enviromentally Friendly
- DNA VERIFIED.
- FULL TRACIBILITY OF ANIMAL WELFARE
- SEX SELECTED

RCI
Robotic Cow Index

Ultraplus

Ecofeed

Chromosomal
Mating

STrategy

Vision+

Ecofeed

On Farm
Optimization

Traceability

Monitoring

Individual
Care

Much more than just a Genetic Source. An Integrated Force.

STgenetics®

STgen Inc.

Thank you!


The best way
to predict the future
is to Create it
Ultraplus
Legend
Vision
Ecofeed
Ultraplus
HornPurity
Farmfit
Beef
Chromosomal
Matin
STamina
STrategy
STgenetics