Vytelle. Always Progressing

The Journey to a Sustainable Herd

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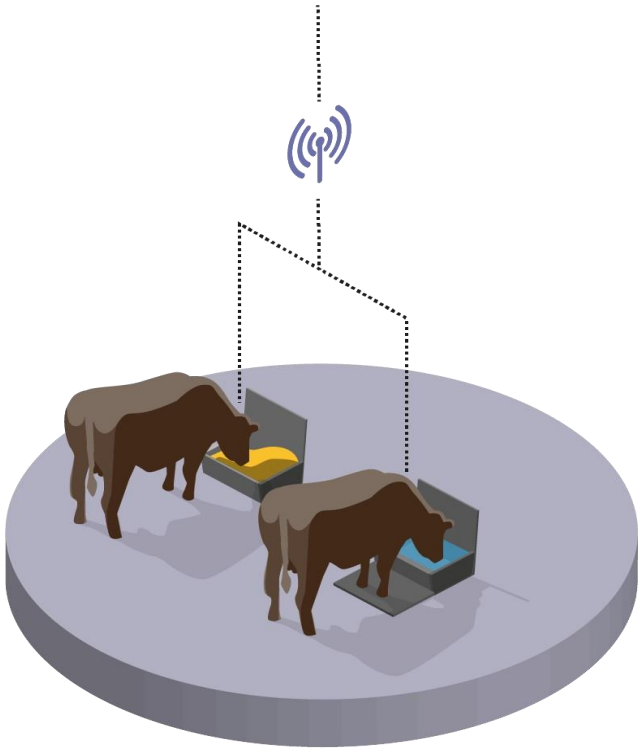
Euroopa Maaelu Arengu Põllumajandusfond: Euroopa investeeringud maapiirkondadesse

Vytelle Advances the RIGHT genetics FASTER

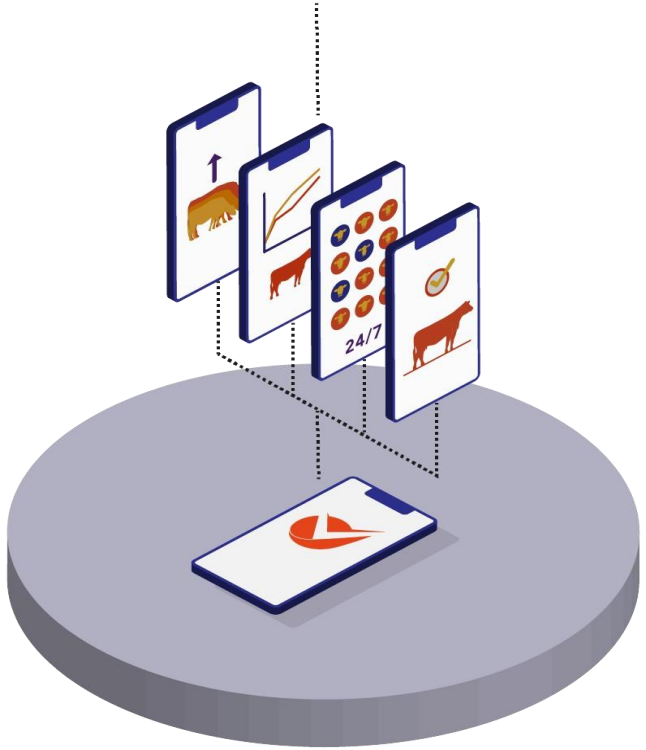
Integrated Technology Platform

SENSE



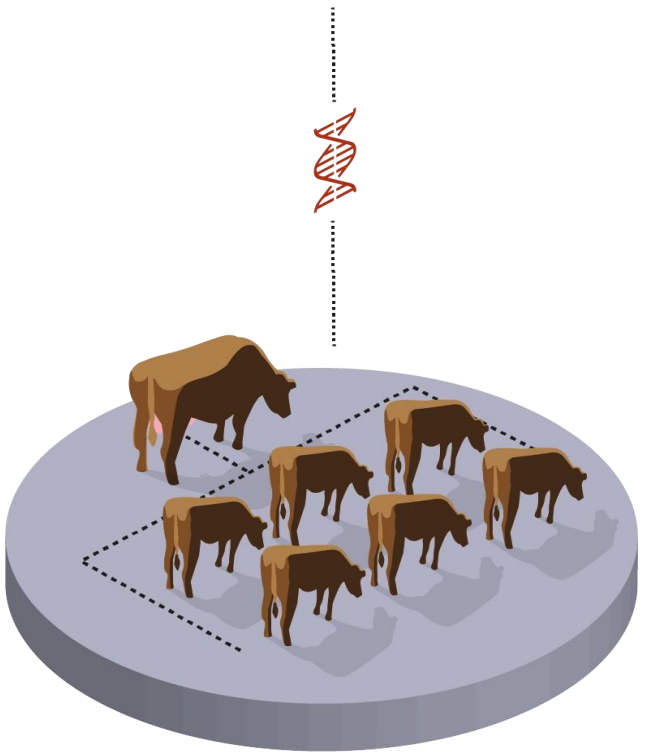
Phenotype Data Capture

INSIGHT



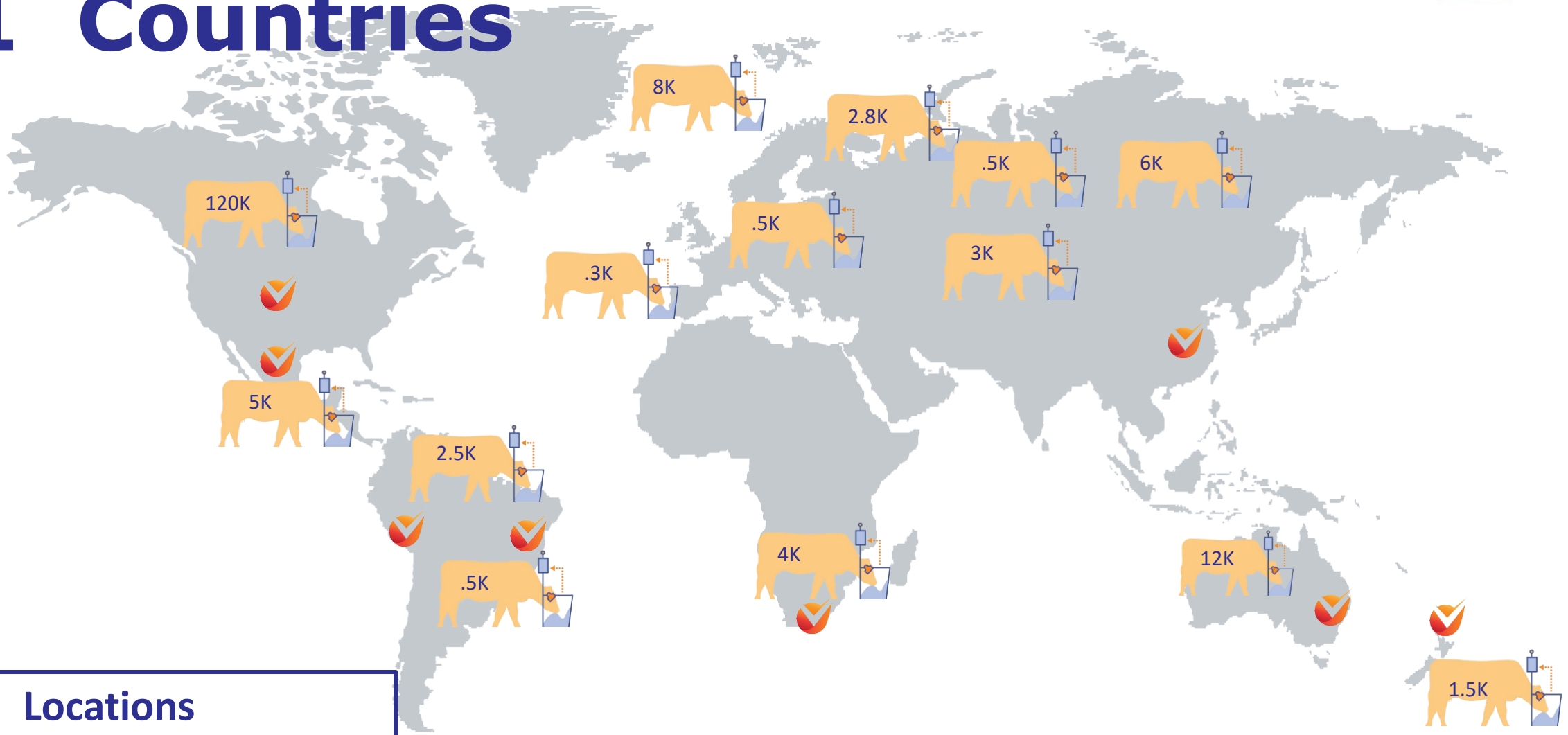
Decision Support Tools

ADVANCE



In Vitro Fertilization

Vytelle Global Impact – 21 Countries



167 Locations

166K Annual Capacity

Embryo Production

Some Thoughts on Feed Efficiency

Profit Matters

Improving feed efficiency will increase your profitability

.

Reduction of GHG

Improving feed efficiency is the most proven, scalable way to impact methane emissions

Phenotype Matters

Continually collected, standardized, phenotypic data matters

Proven Trait

Genetic Selection is Compounding & Lasting

Technology

Allows us to do this

Take Action

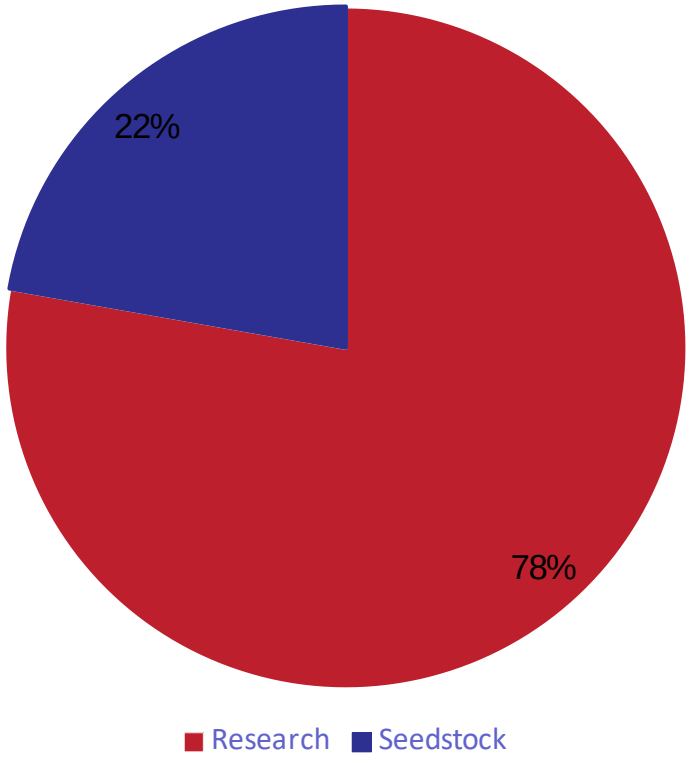
What can you do NOW?

Efficiency Trends Globally

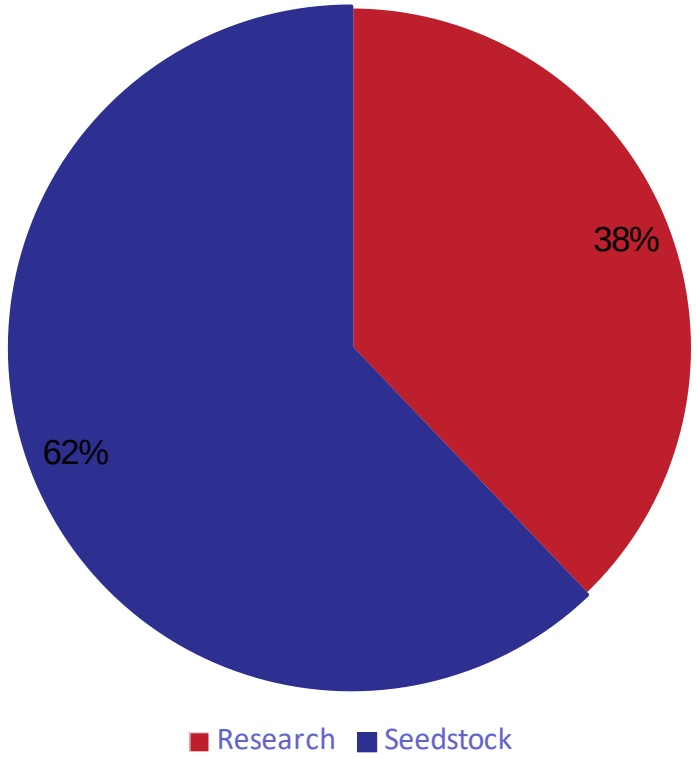
- Growing awareness and investment outside the USA
- Shift from Research / University to Breeding Farms
- Incorporation of Feed Efficiency in Beef & Dairy breeding programs and indexes
- Integral Part of Low Carbon / GHG reduction frameworks

Feed Efficiency Trends From R&D to Adoption

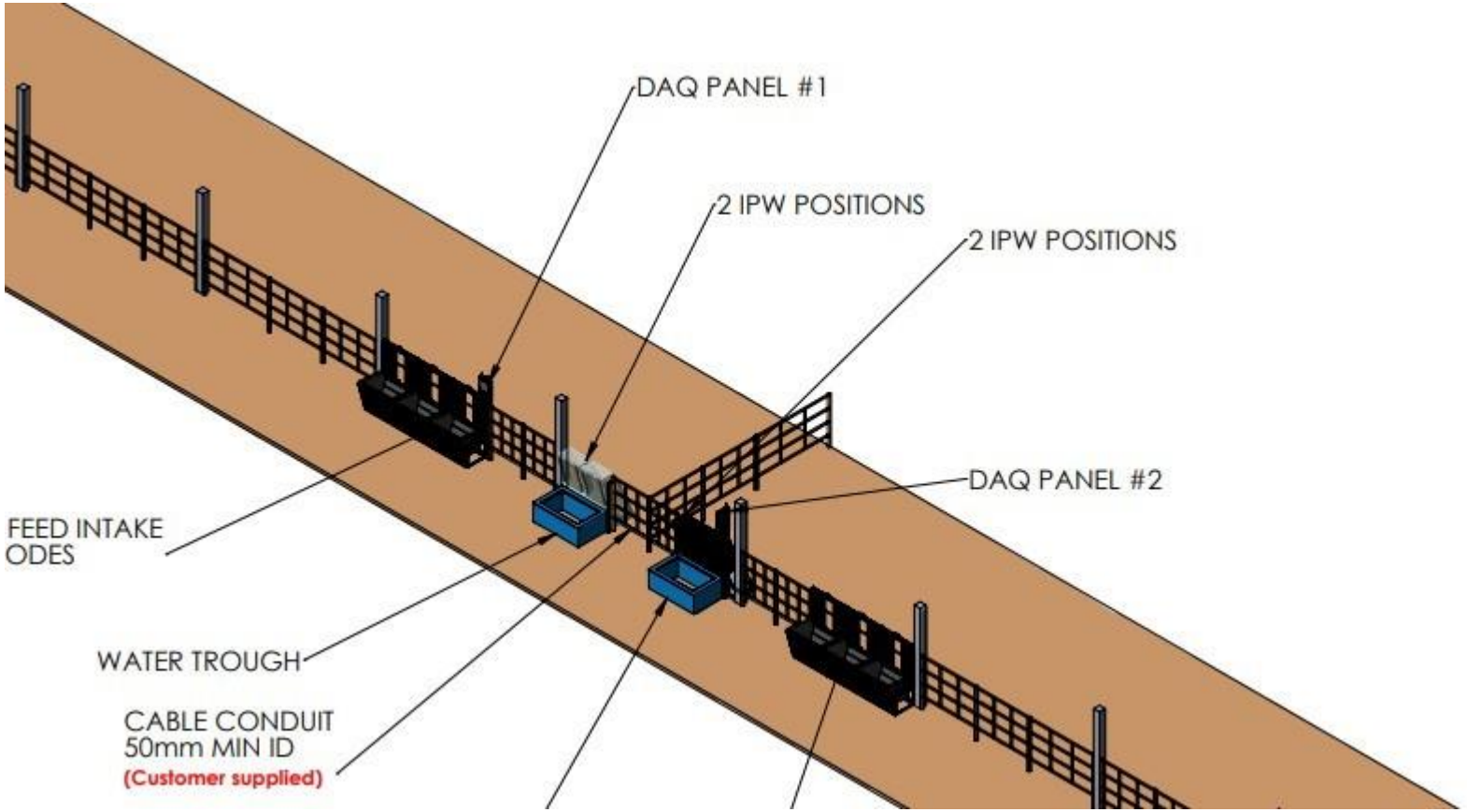
2012



2023



ABAE Estonia



Selection for Feed Efficiency is one of the key drivers of Sustainable Beef Production

Feed Efficient Cattle produce less GHGs*

Selecting for Feed Efficiency is the most scalable way to reduce cost & increase profit

The use of Residual Feed Intake (expected feed intake vs actual feed intake) delivers cow efficiency = more animal units on the same resources

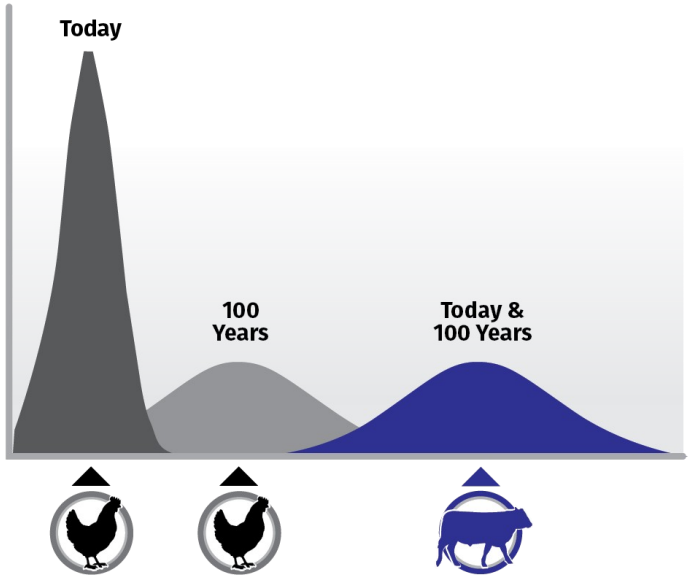
* .83 correlation DMI and Methane

Understanding Feed Efficiency

Genetic Progress is a Proven Solution

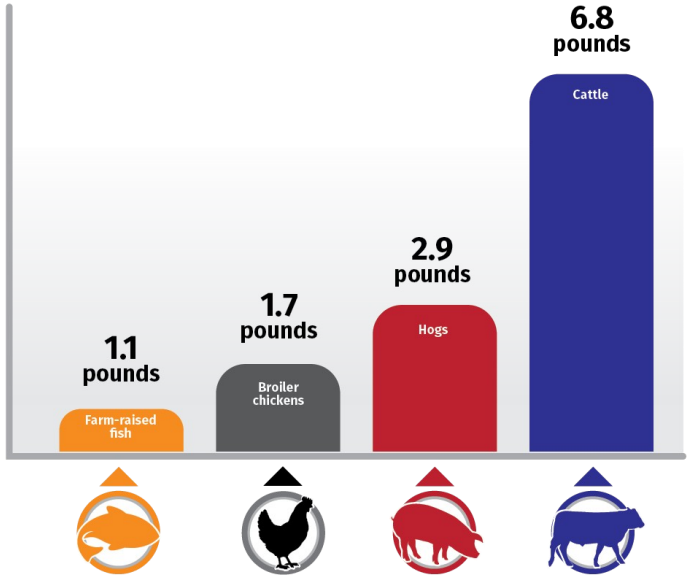
Triple Challenge

Beef and chicken comparison



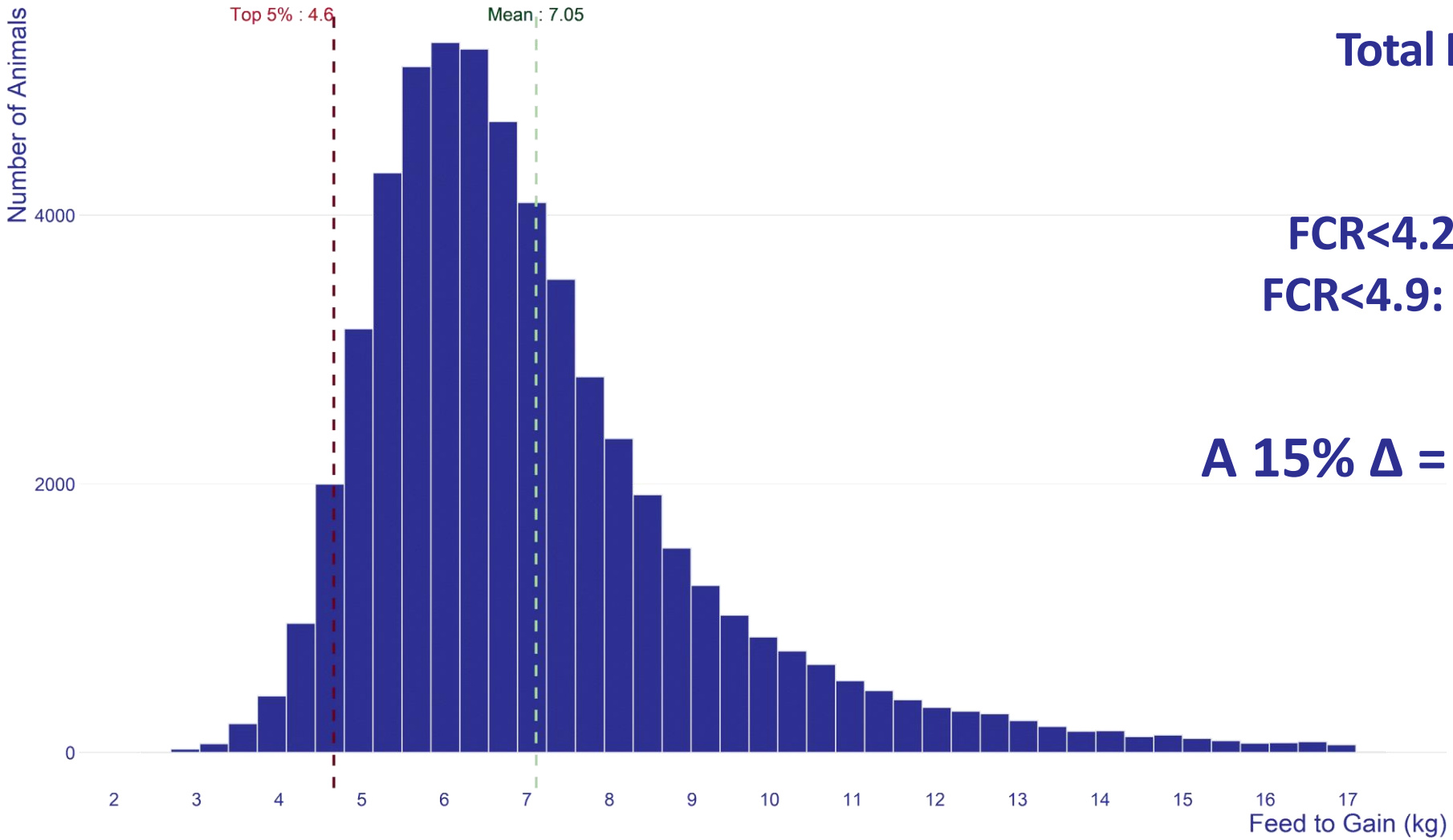
Measured performance

Feed conversion ratio



Estimated feed required to gain one pound of body mass.

Change is Possible



Total Records: 56,000
Average: 7.05

FCR<4.2: 2% population
FCR<4.9: 10% population

A 15% Δ = FCR of 5.99:1

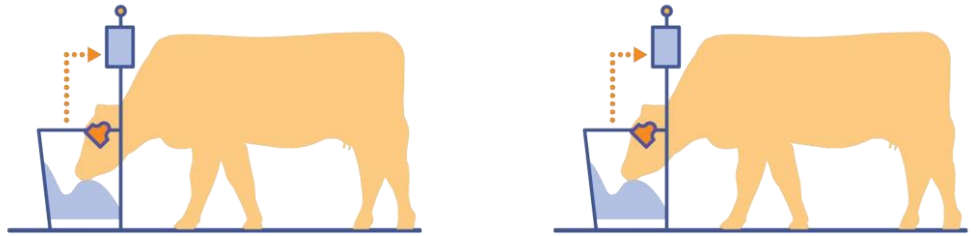
Net Feed Intake Explained

- **Net Feed Intake (NFI):** difference between an animal's actual intake and their expected intake for a given body size and growth rate

  Low NFI = Efficient

  High NFI = Inefficient
- Moderately heritable trait
- Independent of body weight and size
- Differences in the trait cannot be seen, must be measured

Actual Feed Intake - Expected Feed Intake = NFI



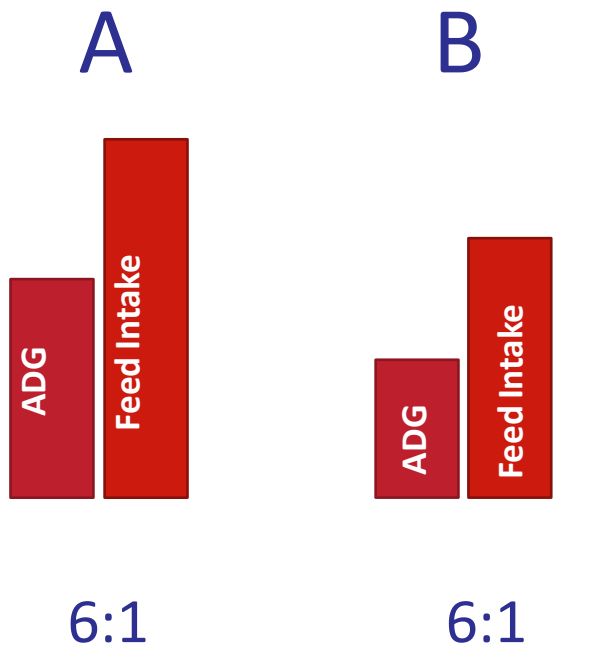
8.6 kg - 10.4kg = - 1.8Kg

This Bull has a Negative -1.8 NFI

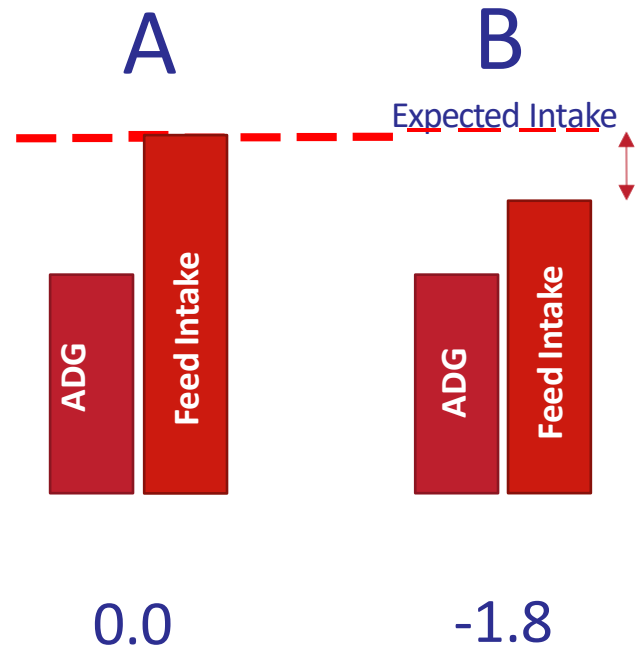
Comparing Measures of Feed Efficiency

Which one is most efficient?

Feed Conversion Ratio



Net Feed Intake

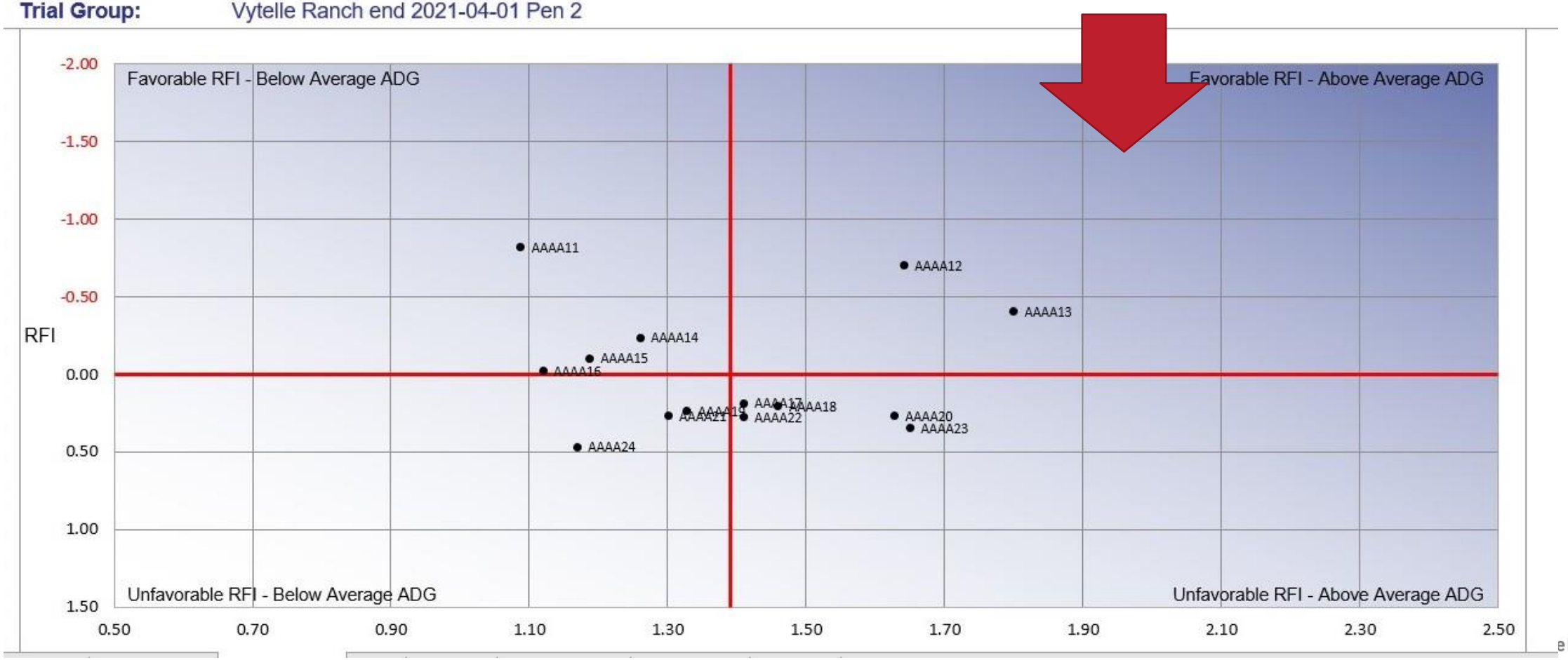


Vytelle INSIGHT

Beef Genetics: Feed Efficiency Report

RFI & ADG Distribution

Customer:	Vytelle Ranch	**Sex:**	Bull
Start/End Date:	2021-01-19 / 2021-04-01	**Dry Matter %:**	76.00%
Units:	Kg & cm		
Trial Group:	Vytelle Ranch end 2021-04-01 Pen 2		



Methane Emissions & Feed Efficiency

- Feed intake one of key drivers of enteric methane emissions
- Can improvements to feed efficienc (NFI) lower methane emissions???
- This Study Concluded The Potential for Selection for low NFI to
  - Reduce daily methane emissions
  - Reduce daily methane emissions without negatively impacting on farm profitability

Journal of Animal Science, 2021, Vol. 99, No. 11, 1–13

https://doi.org/10.1093/jas/skab275
Advance Access publication October 01, 2021
Received: 7 August 2021 and **Accepted:** 29 September 2021
Environmental Animal Science

ENVIRONMENTAL ANIMAL SCIENCE

Effect of divergence in residual methane emissions on feed intake and efficiency, growth and carcass performance, and indices of rumen fermentation and methane emissions in finishing beef cattle

Paul E. Smith,[*,†] Sinead M. Waters,[*] David A. Kenny,[*] Stuart F. Kirwan,[*] Stephen Conroy,[‡] and Alan K. Kelly[†,1]

[*]Teagasc, Animal and Bioscience Research Department, Animal and Grassland Research and Innovation Centre, Grange, Dunsany, County Meath, Ireland, [†]UCD School of Agriculture and Food Science, University College Dublin, Belfield, Dublin 4, Ireland, [‡]Irish Cattle Breeding Federation, G€N€ IR€LAND Progeny Test Centre, Tully, Kildare Town, County Kildare, Ireland

Measuring & Selecting for Feed Efficiency is the most scalable way to impact emissions & profit

* Paul E Smith[1] and Sinéad M Waters[1]

https://pubmed.ncbi.nlm.nih.gov/34596276/

Why Feed Efficiency Matters?

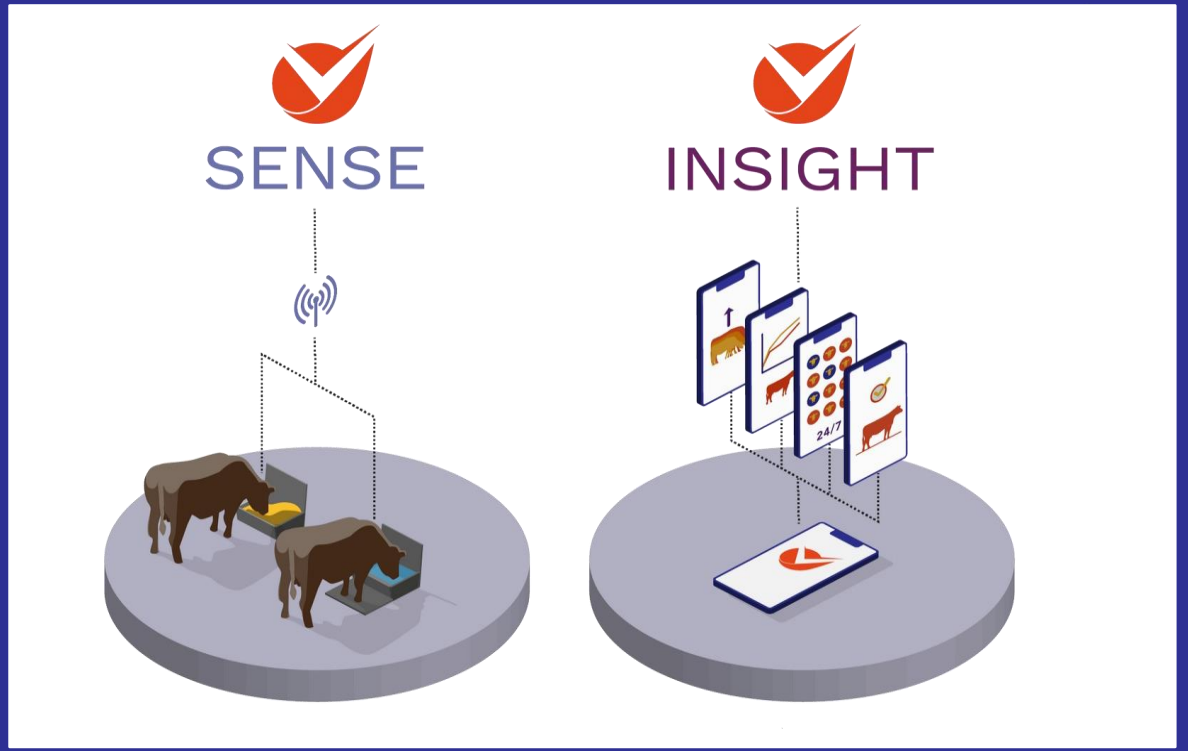
Genetic selection for feed efficiency will

- Reduce feed intake by up to 12%
- Reduce methane production by
- 30% Increase Value of Progeny
- Improve profitability across the supply chain

1 Agri-facts; Practical Information for Alberta's Agriculture Industry (2006), https://open. alberta.ca/dataset/91a77dec-f0a4-49c2-8c54-f172fe568e2c/resource/721e982c-b90f-4605- 9de0-a3b8bb312b1f/download/2006-420-11-1.pdf, accessed October 9, 2018.

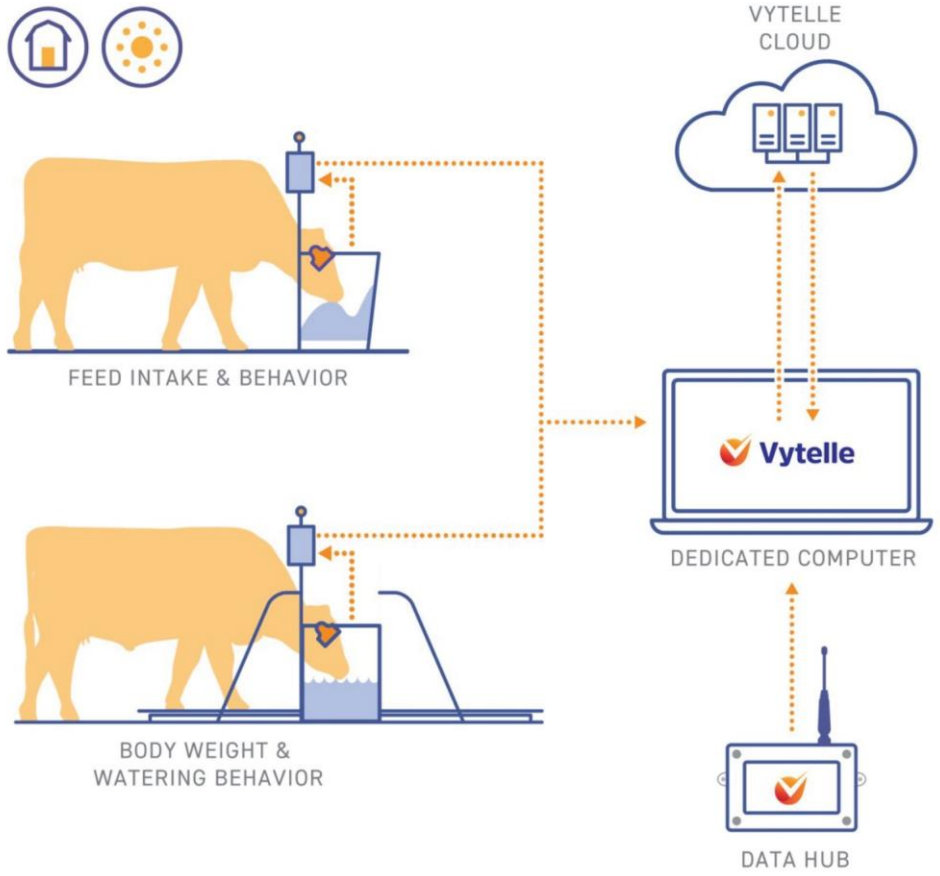
Beef Genetics Program

Using a Data Analytics Platform to Genetically Select for Feed Efficiency



Vytelle SENSE Vytelle INSIGHT

How the program works



Dashboard Reporting
Daily Alerts
End-of-Monitoring Period Analytics for Decision

Feed Intake Syst Vytelle SENSE
Individual Animal Feed Consumption

- Animals RFID ear tagged
- RFID antenna in trough rim
- Trough on load cells – 3 g resolution
- Measured each second
- Trial Protocols Built into Software
- Standardized Automated Computation
- Incorporating Behavior, Diet, Environment

In-Pen Weighing (IPW)

Vytelle SENSE

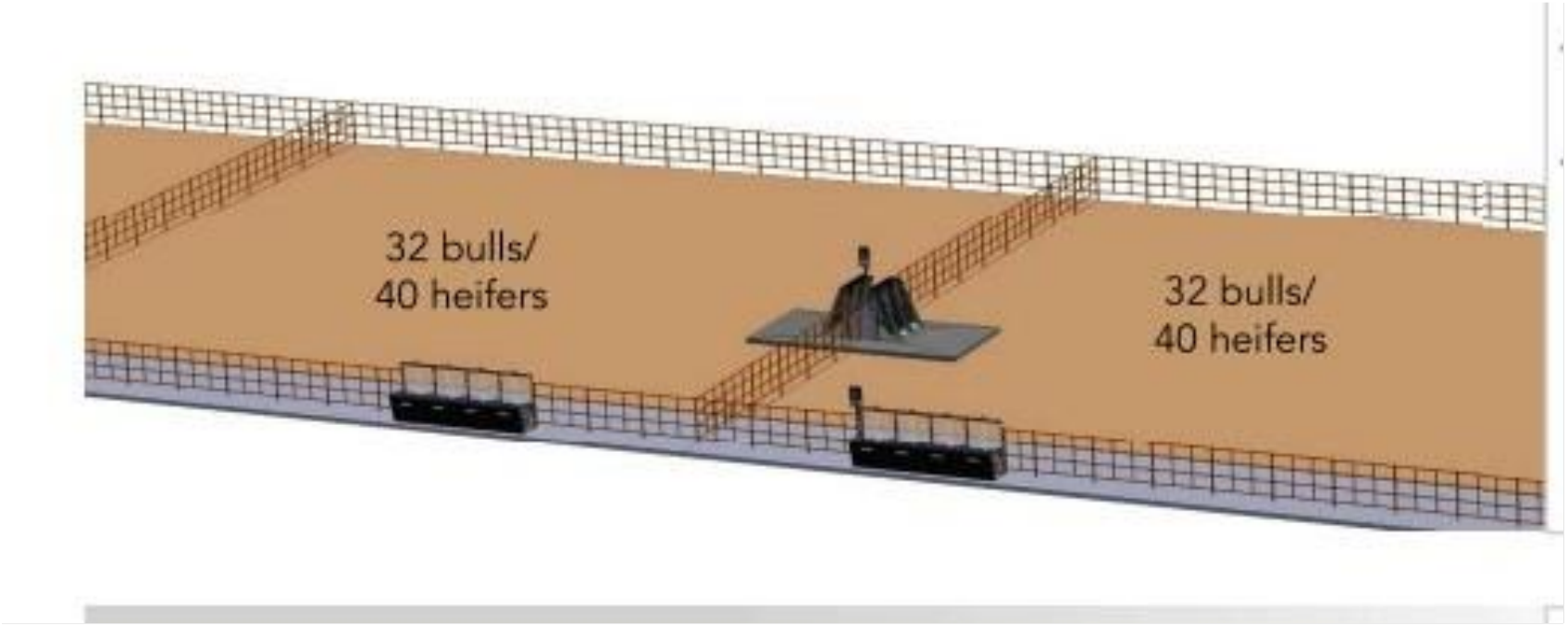
DAQ Panel

Antenna

Partial Body Weight Measurement
Converts partial body weight to Live Weight

Load Bar
Below the Structure

Typical 2 Pen On Farm System



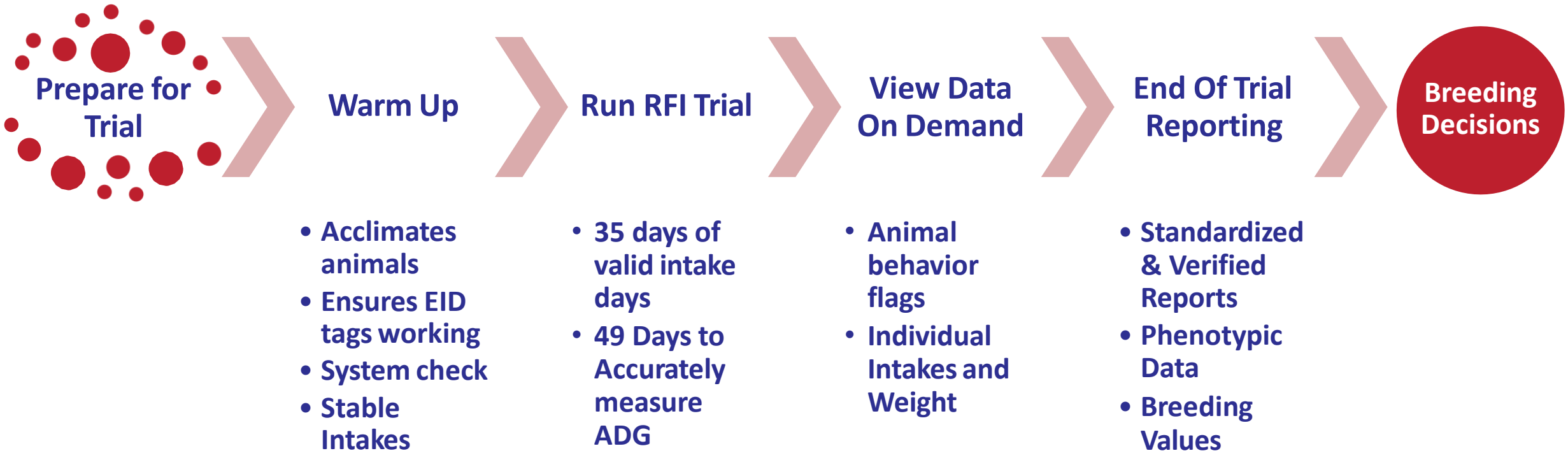
Testing Capacity:

Each Pen Max 40 Head

Per Trial : 40H * 2 = 80 Head

~5 Trials Per Year = 400 Head

Standardized Trials – How does it work?



Average Total Trial Duration – 63 days

Trial Reporting & Data Analytics

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ef Genetics: Feed Efficiency Report

omer: Vytelle Ranch
'End Date: 2021-01-19 / 2021-04-01
: Kg & cm
Group: Vytelle Ranch end 2021-04-01 Pen 2

Sex: Bull
Dry Matter %: 76.00%

port

NO.	REGISTRY	ID	ALT ID	EID	DOB	ORIGIN	RFI EPD	RFI ACCURACY	RFI % RANK	ADG EPD	ADG ACCURACY	ADG % RANK	DMI EPD	DMI ACCURACY	DMI % RANK	SIRE REGN. NO.	SIRE REGISTRY	DAM REGN
00	ZZZ	AAAA11		840000000000001	2020-04-04	Vytelle Ranch	0.1096	0.2098	86	0.0412	0.1500	8	0.2044	0.2035	91	PB25456	ZZZ	PB15
01	ZZZ	AAAA12		840000000000002	2020-04-15	Vytelle Ranch	0.0296	0.2266	78	0.0060	0.1719	22	0.0223	0.2233	79	FB27425	ZZZ	FB24
02	ZZZ	AAAA13		840000000000003	2020-05-01	Vytelle Ranch	0.1851	0.1991	90	-0.0086	0.1417	35	0.0838	0.1930	85	PB25456	ZZZ	PC31
03	ZZZ	AAAA14		840000000000004	2020-04-16	Vytelle Ranch	-0.0762	0.2402	62	-0.0312	0.1833	50	-0.1713	0.2369	58	FB27425	ZZZ	FB22
04	ZZZ	AAAA15		840000000000005	2020-04-20	Vytelle Ranch	-0.2879	0.2267	11	-0.0611	0.1720	58	-0.4070	0.2234	20	FB27425	ZZZ	FB32
05	ZZZ	AAAA16		840000000000006	2020-04-27	Vytelle Ranch	-0.2695	0.2226	13	0.0287	0.1680	11	-0.0846	0.2190	66	FB27425	ZZZ	FB14
06	ZZZ	AAAA17		840000000000007	2020-04-16	Vytelle Ranch	0.0335	0.2212	79	0.0006	0.1668	27	-0.0041	0.2177	74	FB27425	ZZZ	FB18
07	ZZZ	AAAA18		840000000000008	2020-04-27	Vytelle Ranch	-0.0593	0.2280	64	-0.0488	0.1732	56	-0.2378	0.2247	50	FB27425	ZZZ	FB24
08	ZZZ	AAAA19		840000000000009	2020-04-14	Vytelle Ranch	0.1220	0.1800	86	0.0323	0.1245	10	0.1877	0.1731	90	PB32212	ZZZ	PB19
09	ZZZ	AAAA20		840000000000010	2020-04-21	Vytelle Ranch	0.0855	0.2042	84	-0.0022	0.1465	31	0.0485	0.1983	82	PB25456	ZZZ	PC32
10	ZZZ	AAAA21		840000000000011	2020-04-05	Vytelle Ranch	0.0819	0.2098	83	0.0304	0.1500	11	0.1515	0.2035	89	PB25456	ZZZ	PB15
11	ZZZ	AAAA22		840000000000012	2020-04-06	Vytelle Ranch	-0.0388	0.2098	67	0.0412	0.1500	8	0.1193	0.2035	87	PB25456	ZZZ	PB15
12	ZZZ	AAAA23		840000000000013	2020-05-17	Vytelle Ranch	0.0225	0.2206	77	0.0068	0.1663	22	0.0189	0.2171	79	FB27425	ZZZ	FB31
13	ZZZ	AAAA24		840000000000014	2020-04-20	Vytelle Ranch	-0.1016	0.2208	59	0.0045	0.1665	24	-0.0604	0.2172	68	FB27425	ZZZ	FB27

ry

	REGISTRY	ID	ALT ID	EID	DOB	ORIGIN	RFI EPD	RFI ACCURACY	RFI % RANK	ADG EPD	ADG ACCURACY	ADG % RANK	DMI EPD	DMI ACCURACY	DMI % RANK	SIRE REGN. NO.	SIRE REGISTRY	DAM REGN
					2020-04-19		-0.0117	0.2156	67	0.0029	0.1593	27	-0.0092	0.2110	73			
					2020-04-04		-0.2879	0.1800	11	-0.0611	0.1245	8	-0.4070	0.1731	20			
					2020-05-17		0.1851	0.2402	90	0.0412	0.1833	58	0.2044	0.2369	91			

Vytelle INSIGHT

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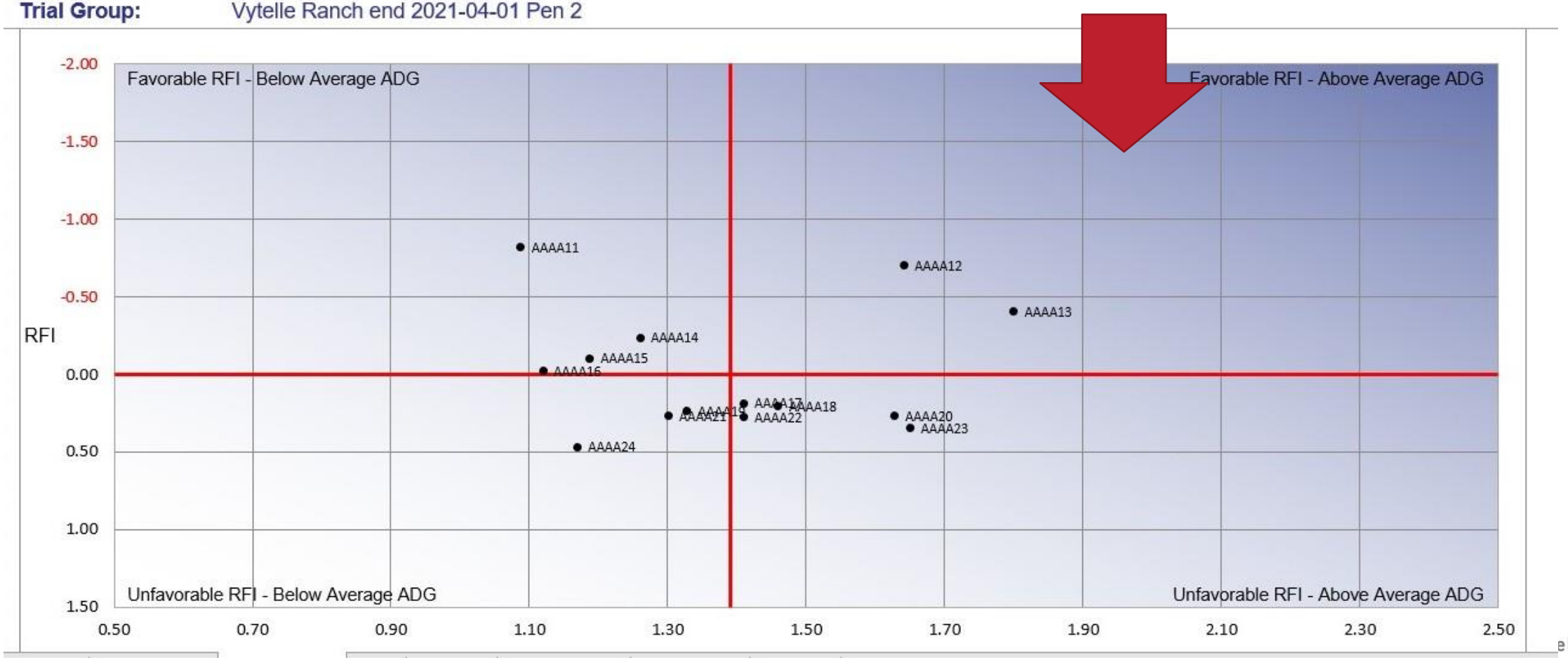
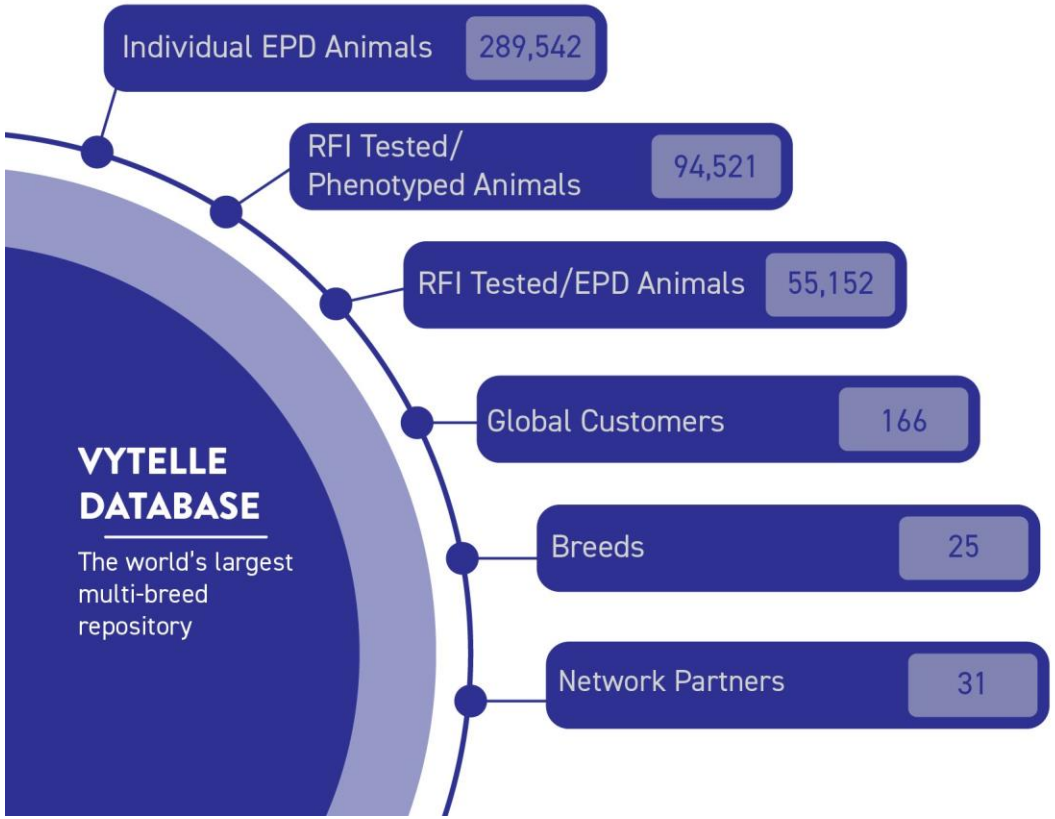


The Vytelle Network

- Largest Beef Efficiency Database Globally
- 25 Breeds
- 94,521 Phenotypes
- 289,542 EPD
- EPDs for Residual Feed Intake, Average Daily Gain and Dry Matter intake

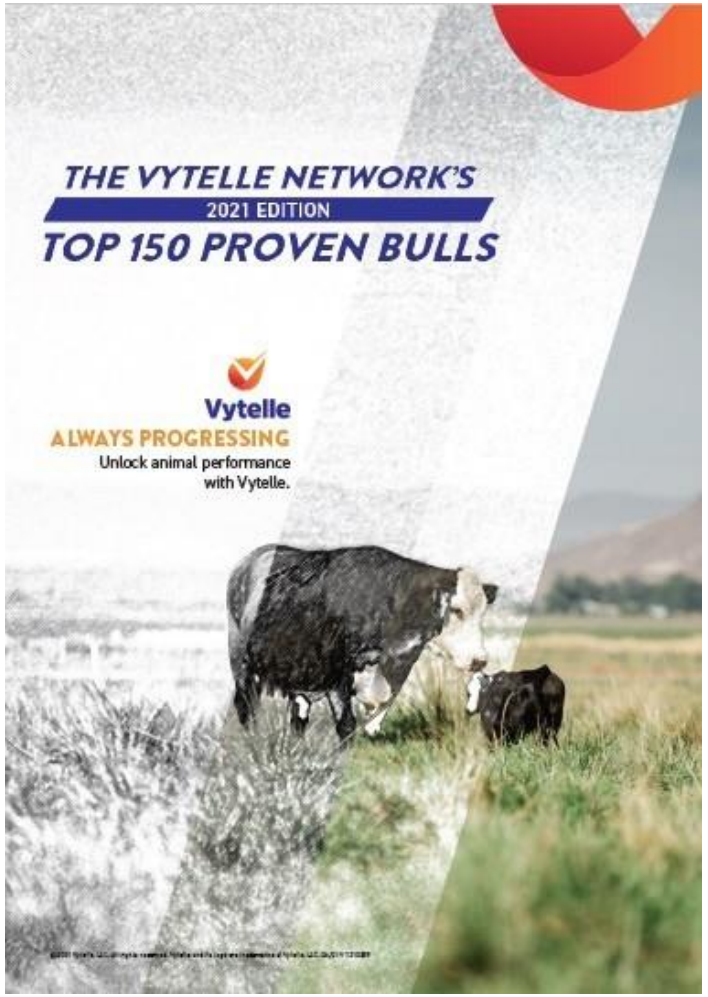


Featuring Progressive Breeders & Associations Globally

THE VYTELLE NETWORK'S 2021 EDITION TOP 150 PROVEN BULLS

Vytelle SENSE

Vytelle INSIGHT



- **We publish the Top 150 Efficient Bulls Annually**
- **Available on Vytelle.com**

Beef Genetics Program

One Integrated Program

Vytelle SENSE

- Hardware

Vytelle INSIGHT

- Efficiency analytics
- Hardware warrant
- Daily remote monitoring

Selecting for A Feed Efficient Cow Herd

Real World Selection Examples

Tale Of Two Cows

Look the same.

Act the same.

Wean the same big, stout, good looking calf.

One eats 20% less.

Variation in Cow Efficiency

	Small Cow	Big Cow	Moderate Cow	Moderate Cow
BW, lbs	1186	1453	1306	1308
Milk Production, lbs	15.8	23.0	17.8	20.4
Hip Height, in.	52	53.0	53.0	53.5
BCS	5.5	6.0	6.0	5.5
DMI, lbs	56.6	45.4	54.4	35.8

Adcock et al., 2010

37% **34%**

Dr. Dan Shike, University of Illinois

Hay = $80.00 per ton

15% Moisture – 100% DM
= $92.00 per ton

= $0.046 per pound

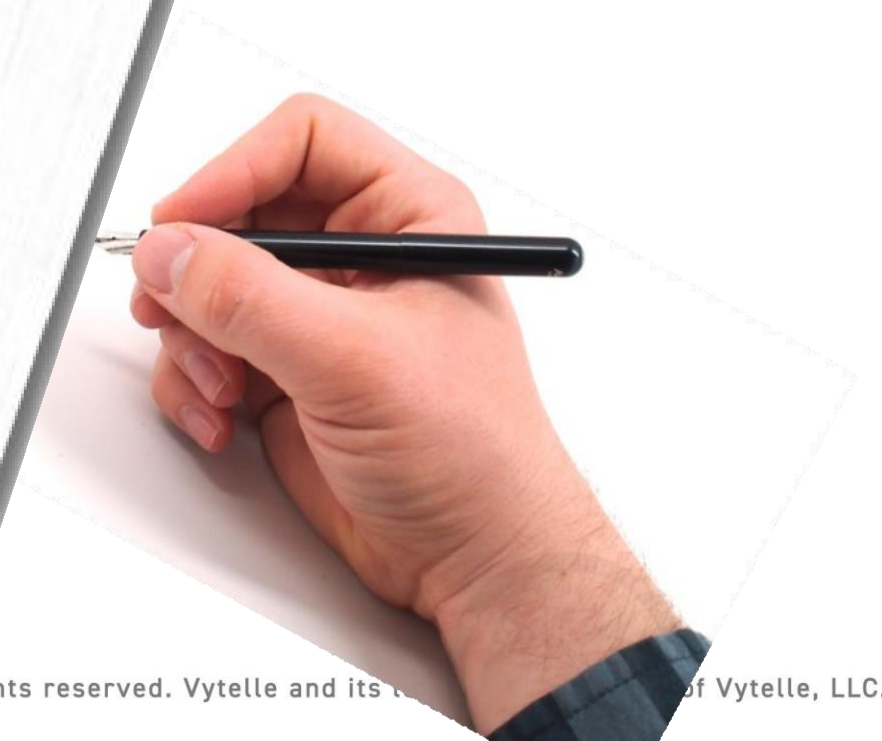
Assume feed hay:
Dec 1st - Apr 30th
= ~150 days

@ 35.8# /day = $1.65/day
x150 days = $ 247.50

@ 56.6# /day = $2.60/day
x150 days = $ 390.00

Net Difference:

$142.50 per cow



Grass Hay = $125.00 per ton

15% Moisture – 100% DM
= $147.00 per ton

= $0.073 per pound

Assume feed hay:
Dec 1st - Apr 30th
= ~150 days

@ 35.8# /day = $2.83/day
x150 days = $ 424.50

@ 56.6# /day = $4.13/day
x150 days = $ 619.50

Net Difference:

$195.00 per cow

Hay = $225.00 per ton

15% Moisture – 100% DM
= $244.00 per ton

= $0.122 per pound

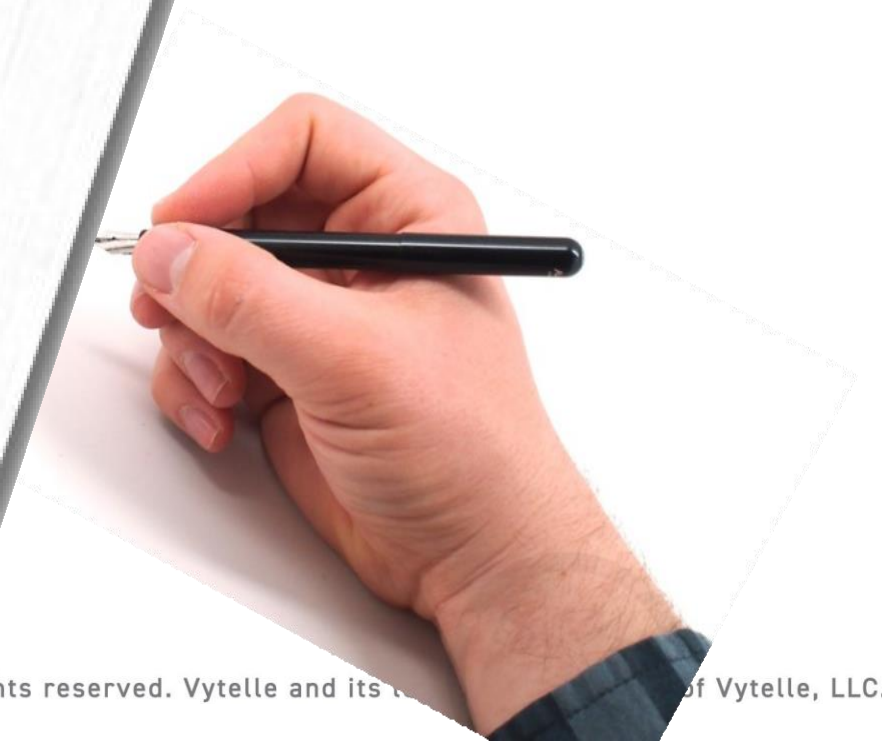
Assume feed hay:
Dec 1st - Apr 30th
= ~150 days

@ 35.8# /day = $4.38/day
x150 days = $ 657.00

@ 56.6# /day = $6.91/day
x150 days = $ 1036.50

Net Difference:

$379.50 per cow



Hay math using a herd of 300 cows

$80/ ton hay:

$142.50 x 300 = $42,750

$125/ ton hay:

$195.00 x 300 = $58,500

$225/ ton hay:

$379.50 x 300 = $113,850

Instead of **100** cows…
What if they could run **120** cows?

#Cows	100	120
90%	90	108
Calf Value	$1,020	$1,020
Sum	$91,800	$110,200

+$18,400

#Cows	300	360
90%	270	324
Calf Value	$1,020	$1,020
Sum	$275,400	$330,500

+$55,100

#Cows	800	960
90%	720	864
Calf Value	$1,020	$1,020
Sum	$734,400	$881,300

+$146,900

Russell Livestock – Russell
USDA Market Report 1/17/22

Feeder Steers
500-600 #
$1.78 - $1.96
Assume – 600# @$1.87
Steers = $1,122

Feeder Heifers
500-600#
$1.52 -$1.69 Assume – 570# @$160.5
Heifer = $915

Assume – We wean 90% calf crop and sell all calves

Tale Of Two Cows

Look the same.

Act the same.

Wean the same big, stout, good looking calf.

One eats 20% less.

Closing Conclusions

- Genetic progress is a proven solution
- Accurate measurement is key to driving Feed Efficiency change
- Measuring has moved from R&D to On-Farm Seedstock producers
- Selecting for Net Feed Intake not only reduces feed cost but is a key driver to reducing methane emissions

Making the Next Generation Better then the Previous One

Thank you!

www.vytelle.com