



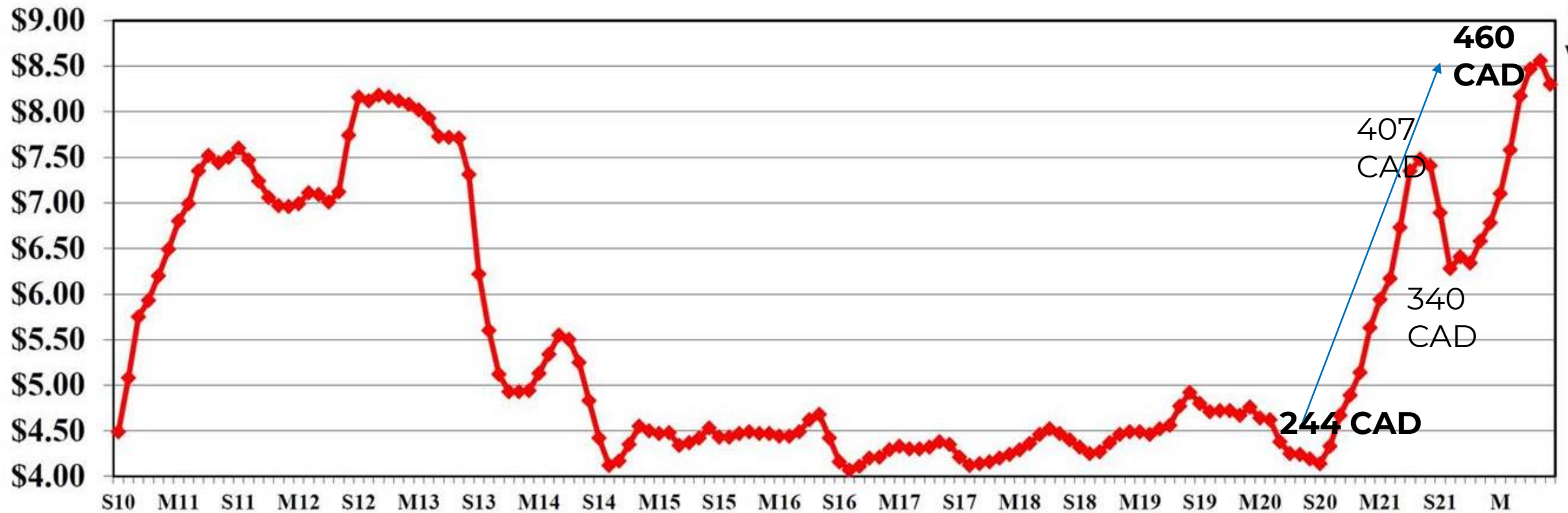
FEEDING BROILERS AND BREEDERS IN TIMES OF HIGH INGREDIENT PRICE MARKETS

Banff, Canada - Oct 6, 2022

**Justina Caldas, PhD
Poultry Nutrition Specialist**

- Volatility in Ingredient and Feed Prices
- Feeding Broiler Breeders in times of high price
- Feeding Broiler in times of high price

Actual Corn Cost/Bushel Sept 2010-Aug 2022



1 USD = 1.38 CAD

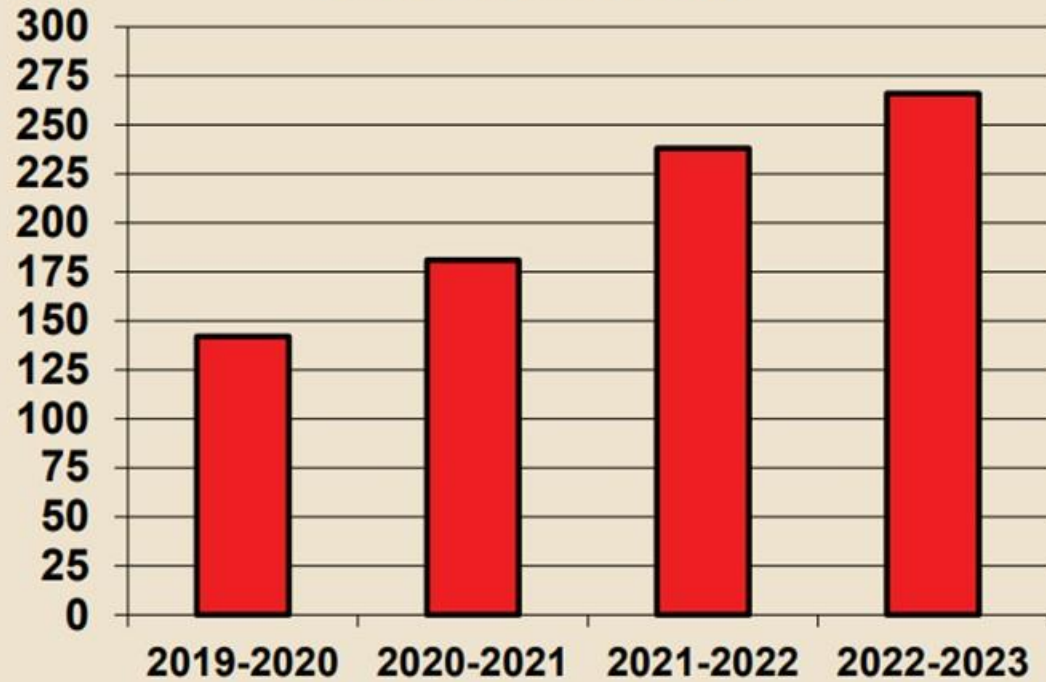
Actual Soybean meal Cost/ton Sept 2010-Aug 2022



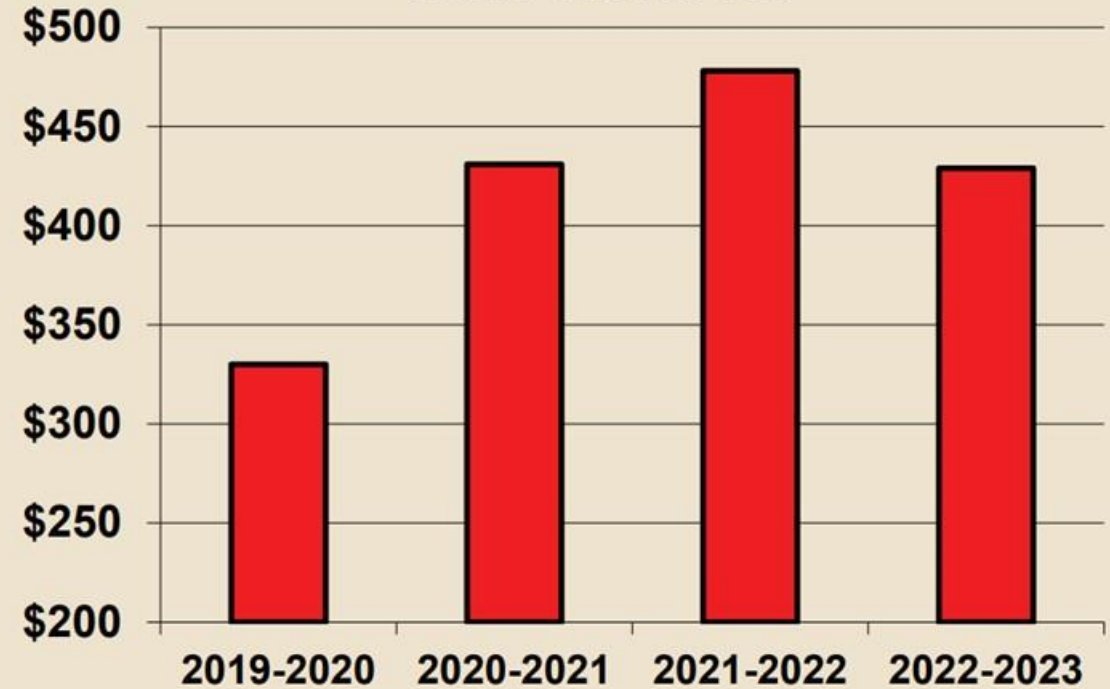
1 USD = 1.38 CAD

Corn and SBM Prices

**Average US Farm Price of Corn
USDA - \$/Metric Ton**



**Average US Crop Year Price of Soybean Meal
USDA - Metric Ton**



Source: Aviagen Broiler Economics by Paul Aho, Vol 30, Issue 4, Aug 2022

US soybean crush increases announced

Company	State	Annual Bu Crush	Facility
S. Dakota SB Processors	SD	35,000,000	New
Cargill	OH	36,500,000	Increase
AGP	NE	50,000,000	New
Norfolk Crush	NE	38,500,000	New
ADM	ND	52,500,000	Increase
Minn. Soybean	ND	45,625,000	New
CHS	MN	21,000,000	Increase
Epitome	MN	42,000,000	New
Bunge/Chevron	LA	49,275,000	Increase
Barlett	KS	38,500,000	New
Bunge/Chevron	IL	49,275,000	Increase
Marquis Energy	IL	38,500,000	New
Shell Rock	IA	38,500,000	New
Cargill	IA	5,250,000	Increase
Platinum Crush	IA	38,500,000	New
Ag Processing Inc.	IA	18,250,000	Increase

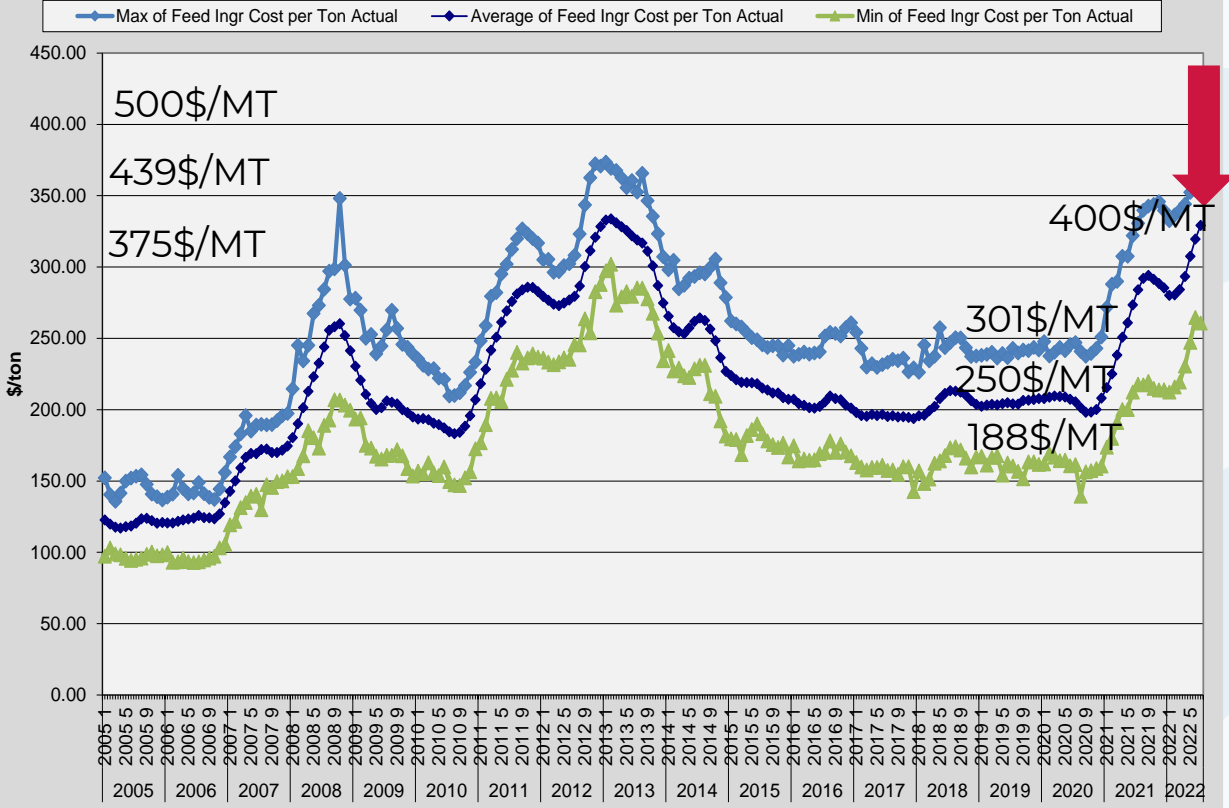
Courtesy, Michael Kidd, Sep 2022

BROILER BREEDERS

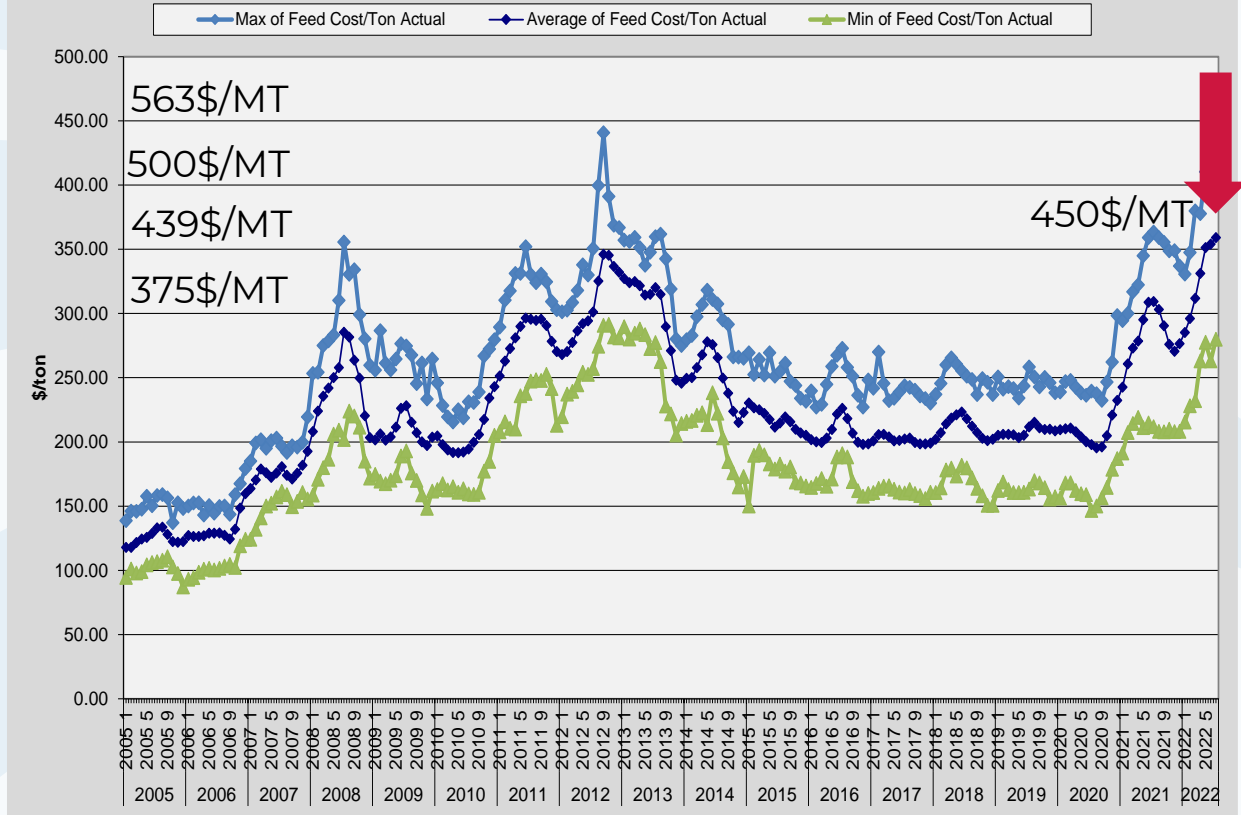


Feed Cost in Breeders, CAD

Pullet Feed Costs per Ton

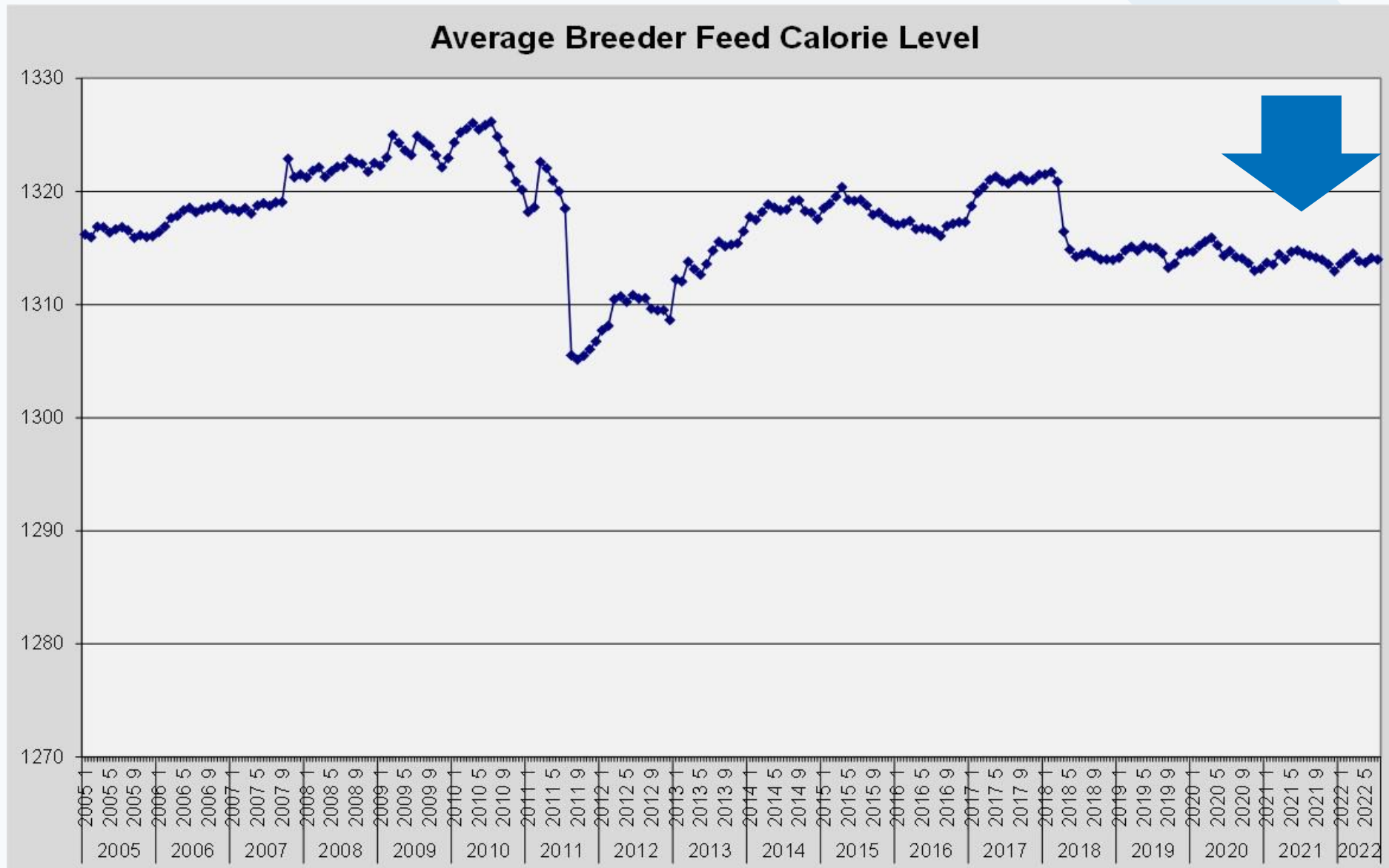


Breeder Feed Cost per Ton



1 USD = 1.38 CAD

No change in energy in Breeder feed

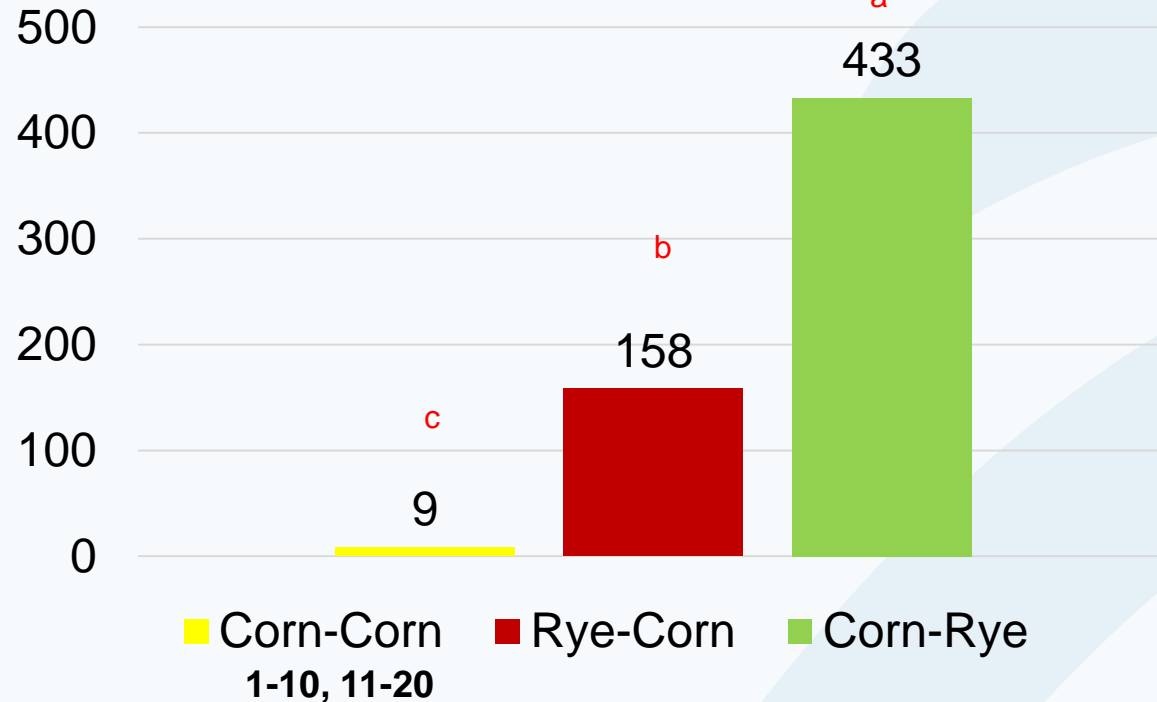


Drastic change of ingredients affect performance

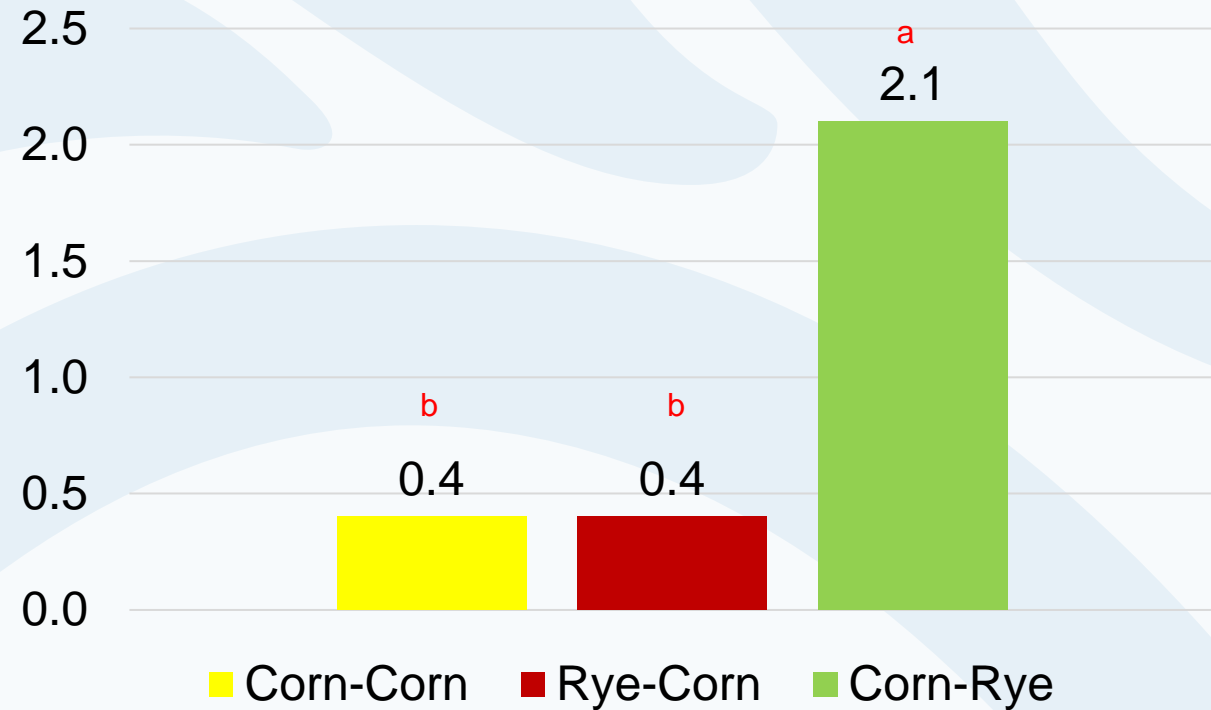
The higher the serum, the more permeability, more risk of bacteria transport into the blood. The lowest, the better

There shouldn't be any bacteria in liver, so the lowest the better

Serum FITC-D (ng/ml)



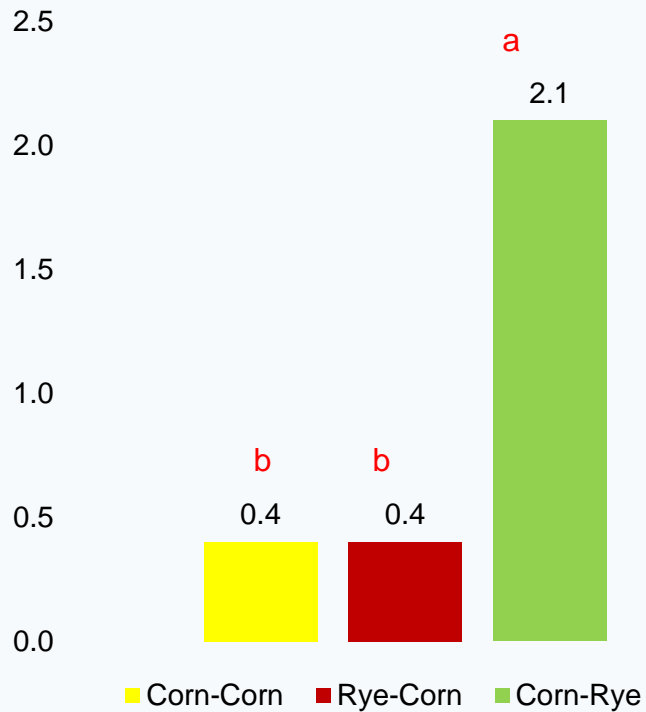
Liver Bacterial translocation (Log10cfu/g)



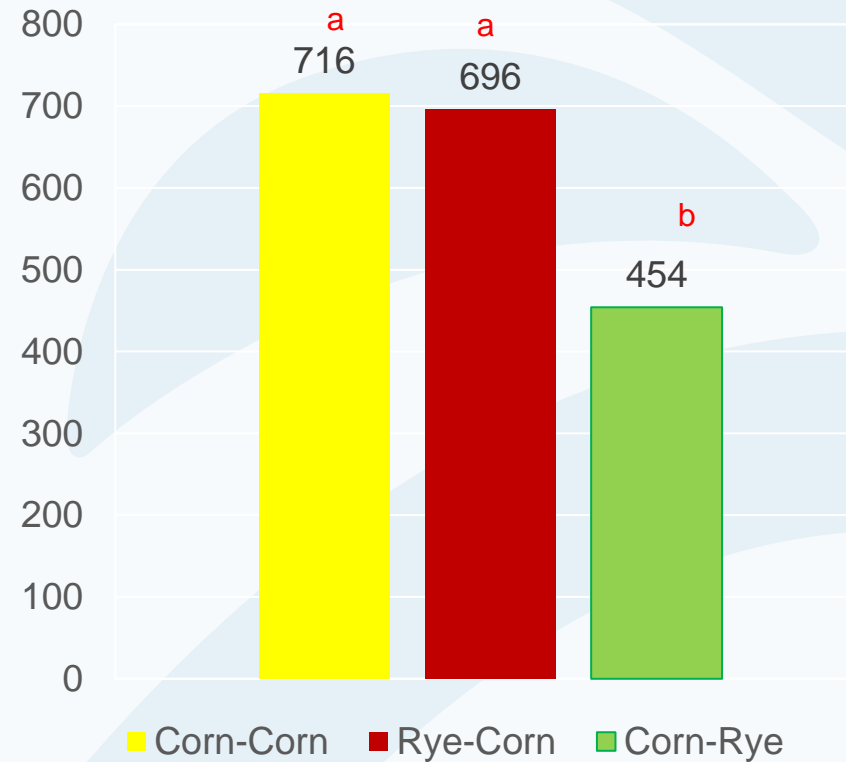
Source: Mikayla Baxter, *et al.*, 2019, *Frontiers in genetics*

Drastic change of ingredients affect performance

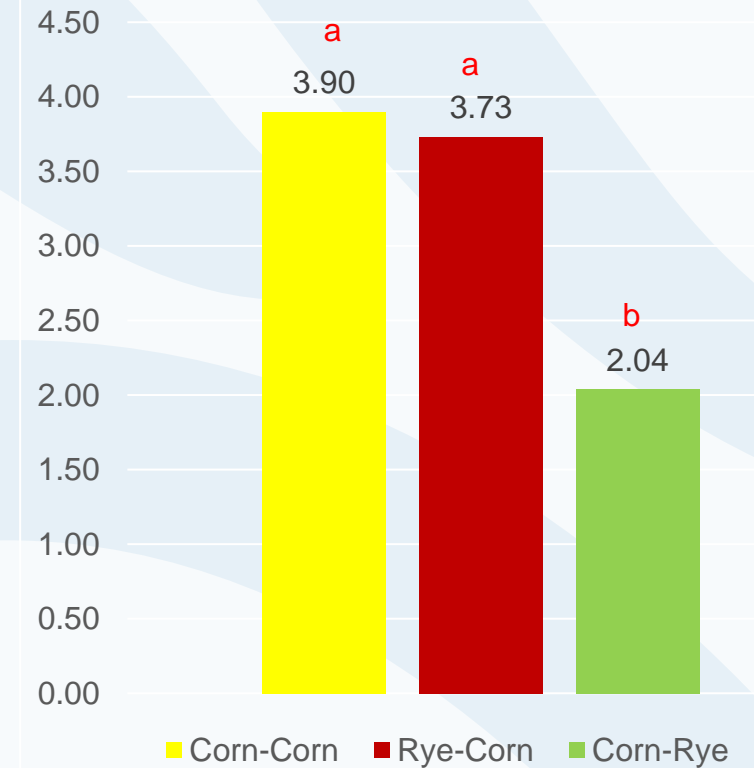
Liver Bacterial translocation (Log10cfu/g)



Body Weight, g



Tibia Strength, kg/mm2

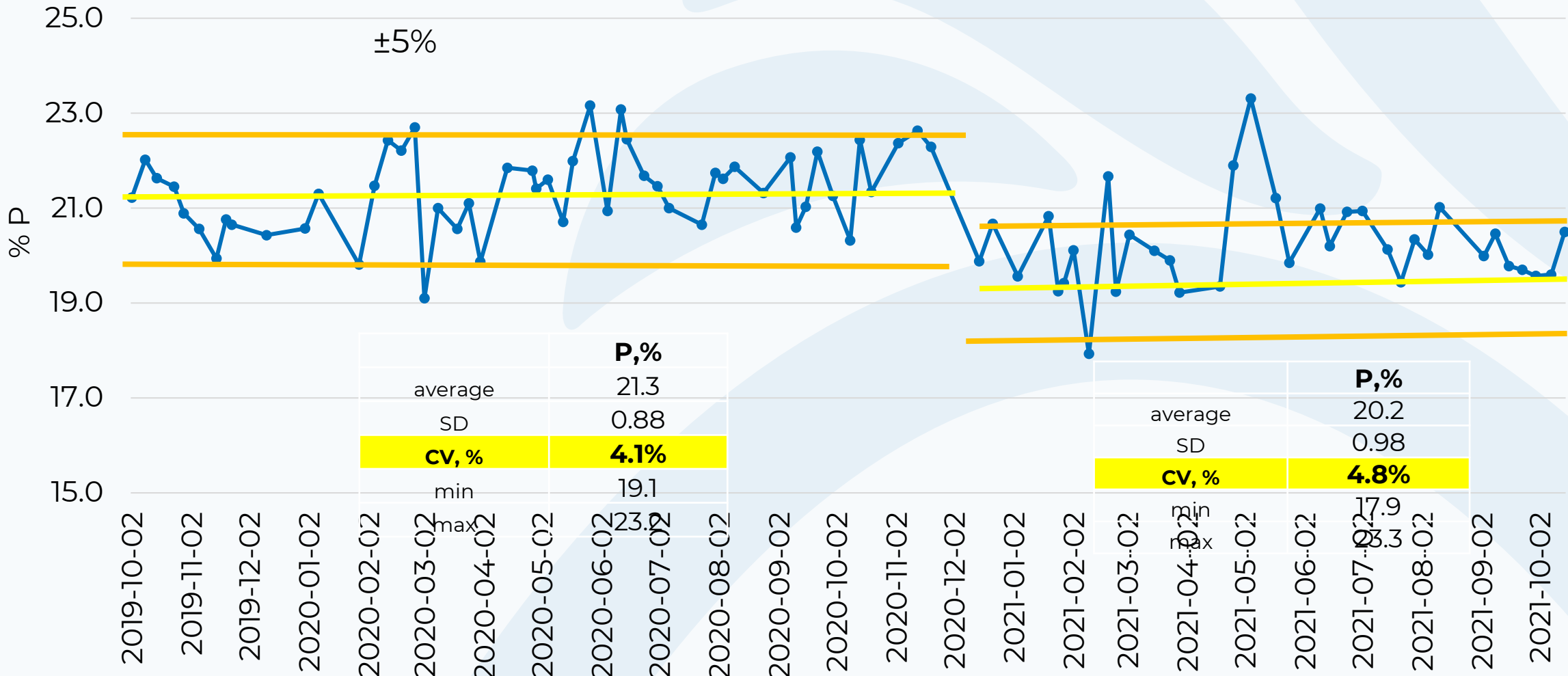


Source: Mikayla Baxter, *et al.*, 2019, *Frontiers in genetics*

Example of ingredient changes

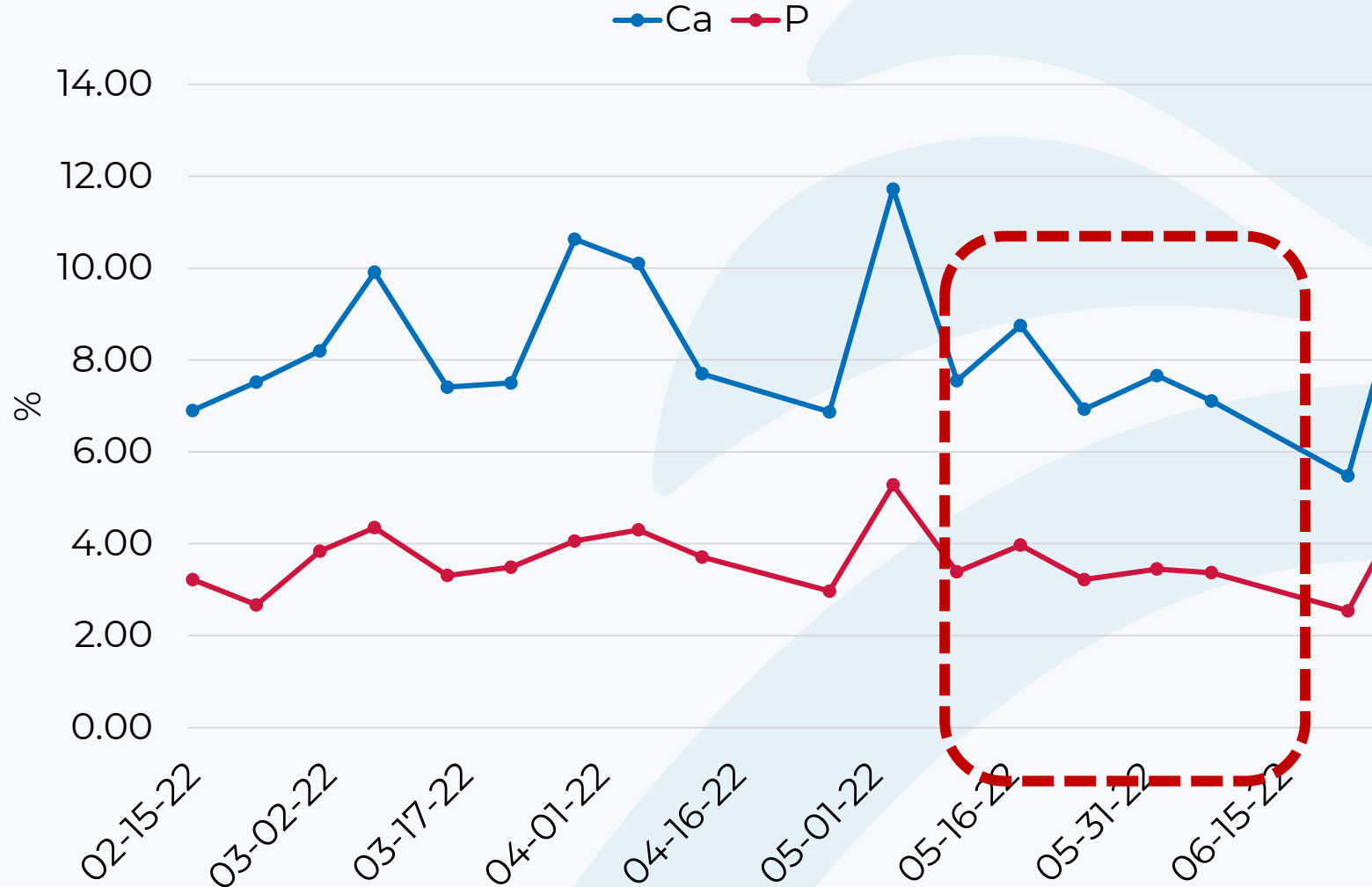
	Pullet Grower		Breeder 1		Breeder 2	
Version	1	2	1	2	1	2
Ingredient Name	%	%	%	%	%	%
CORN	39.1%	39.9%	37.5%	37.5%	37.5%	37.5%
BARLEY	25.0%	9.0%	0.0%	0.0%	0.0%	0.0%
WHEAT	8.8%	24.0%	36.8%	36.0%	37.9%	37.9%
OATS-WHOLE	8.0%	8.0%	0.0%	0.0%	0.0%	0.0%
SOYBEAN ML 1	15.0%	14.9%	6.4%	0.0%	4.3%	0.0%
CONS SBM	0.0%	0.0%	4.1%	15.7%	4.1%	13.5%
CANOLA MEAL	0.0%	0.0%	4.9%	0.0%	5.7%	0.5%
SHELL & BONE	0.00%	0.00%	2.50%	2.50%	2.70%	2.70%
LIMESTONE COARSE	1.50%	1.60%	5.10%	5.10%	5.00%	5.10%
MCP	1.40%	1.50%	0.80%	0.90%	0.80%	0.90%
BREEDER PREMIX 1	0.50%	0.50%	0.00%	0.00%	0.00%	0.00%
BREEDER PREMIX 2	0.00%	0.00%	0.50%	0.50%	0.50%	0.50%
SALT	0.24%	0.10%	0.24%	0.33%	0.19%	0.27%
SODIUM BICARB.	0.22%	0.12%	0.26%	0.16%	0.33%	0.23%

Inorganic Phosphate (MCP)



Example Ingredient Variability

Animal By-Product



	Protein, %	Ca, %	P, %
average	56.23	7.99	3.58
SD	1.76	1.62	0.66
CV, %	3.1%	20.3%	18.5%
min	53.52	5.48	2.54
max	59.61	11.72	5.28

	Protein, %	Ca, %	P, %
average	58.12	6.80	3.15
SD	1.21	0.93	0.41
CV, %	2.1%	13.7%	13.2%
min	56.7	5.48	2.54
max	59.6	7.66	3.45

Example 10wk intake – available Phosphorus Intake

Broiler female
211 g/d



av. Phosphorus intake, mg/d

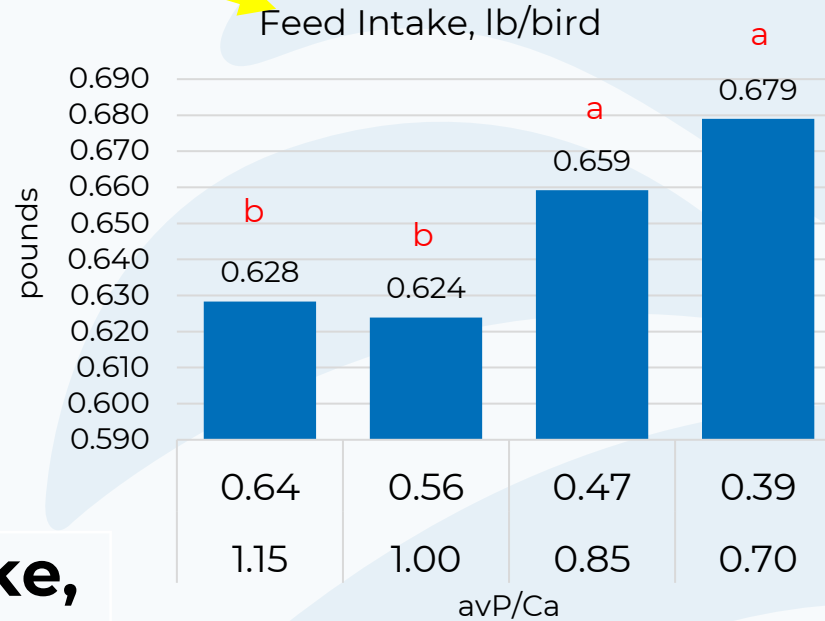
Aviagen Rec	677
Low CV<10	609
High CV<20	542

Pullet female
48 g/d



av. Phosphorus intake, mg/d

Aviagen Rec	202
Low CV<10	182
High CV<20	162



We need to know what are we feeding

Whole Wheat Soft



Soybean Meal



Wheat Middlings



Soy Oil



Monocalcium Phosphate



Limestone Fine



Whole Corn



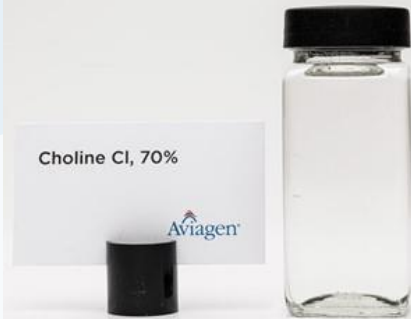
Corn Gluten Meal



Corn Germ Meal



Choline Cl, 70%



Defluorinated Phosphate



Limestone Coarse



Coarse Ground Corn



Meat And Bone Meal



Whole Oats



Methionine
Threonine
Tryptophan
Valine
Arginine
Lysine

Salt 96%



Aviagen Breeder Vitamins



Aviagen Trace Minerals





Security of
Supply

Quality
(consistent
product)

Price \$

308 & 308FF

ROSS 308
Nutrition Specifications
2021

ROSS 308 FF
Nutrition Specifications
2021

PARENT STOCK

4 & 5 Stage Rearing

708

ROSS 708
Nutrition Specifications
2021

PARENT STOCK

2 & 3 Stage Rearing

308AP

ROSS 308 AP
Nutrition Specifications
2021

PARENT STOCK

3 Stage Rearing

Specialty Males EPM/344/YPM

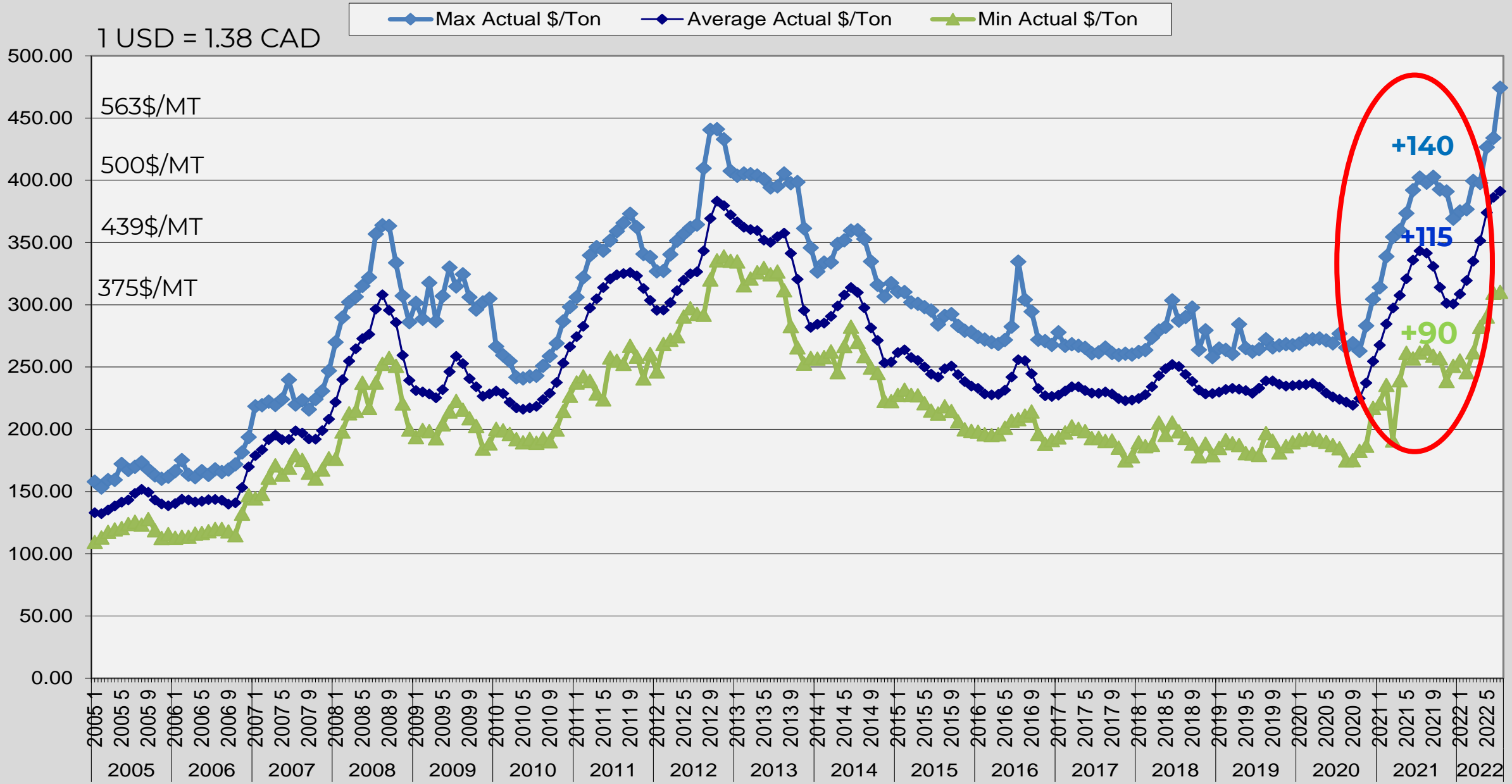
Male Parent Stock Nutrient Specifications Separate Diet in Production

		MALE DIET
		after 175 days
Age		
Energy per kg*	kcal	2900
	kJ	11.7
Energy per lb	kcal	1271
DIESTIBLE AMINO ACIDS		
Lysine**	%	0.35
Methionine	%	0.33
Methionine & Cystine	%	0.58
Threonine	%	0.43
Valine	%	0.47
Tryptophan	%	0.15
Arginine	%	0.68
Leucine	%	0.66
Isoleucine	%	0.41
Histidine	%	0.16
Crude Protein	%	12.0
MINERALS		
Calcium	%	0.70
Available Phosphorus	%	0.35
Sodium	%	0.18-0.20
Chloride	%	0.20-0.23
Potassium	%	0.60-0.75
ADDED TRACE MINERALS PER KG		
Copper	mg	16
Iodine	mg	2
Iron	mg	40
Manganese	mg	120
Selenium	mg	0.3
Zinc	mg	120
ADDED VITAMINS PER KG		
Vitamin A	IU	13000
Vitamin D3	IU	4000
Vitamin E	IU	100
Vitamin K (Menadione)	mg	6
Thiamin (B1)	mg	5
Riboflavin (B2)	mg	15
Niacin	mg	50
Pantothenic Acid	mg	20
Pyridoxine (B6)	mg	5
Biotin	mg	0.3
Folic Acid	mg	3
Vitamin B12	mg	0.07
MINIMUM SPECIFICATION		
Choline per kg	mg	1400
Linoleic Acid	%	1.25

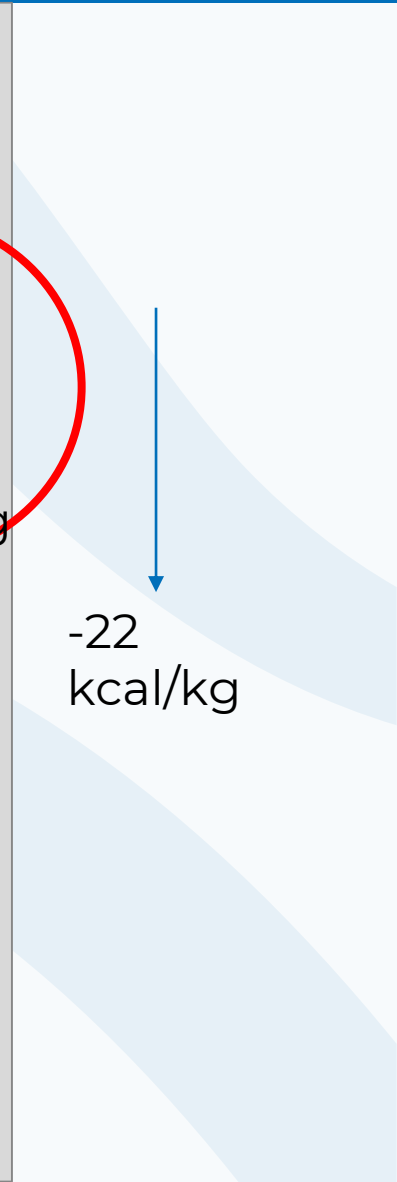
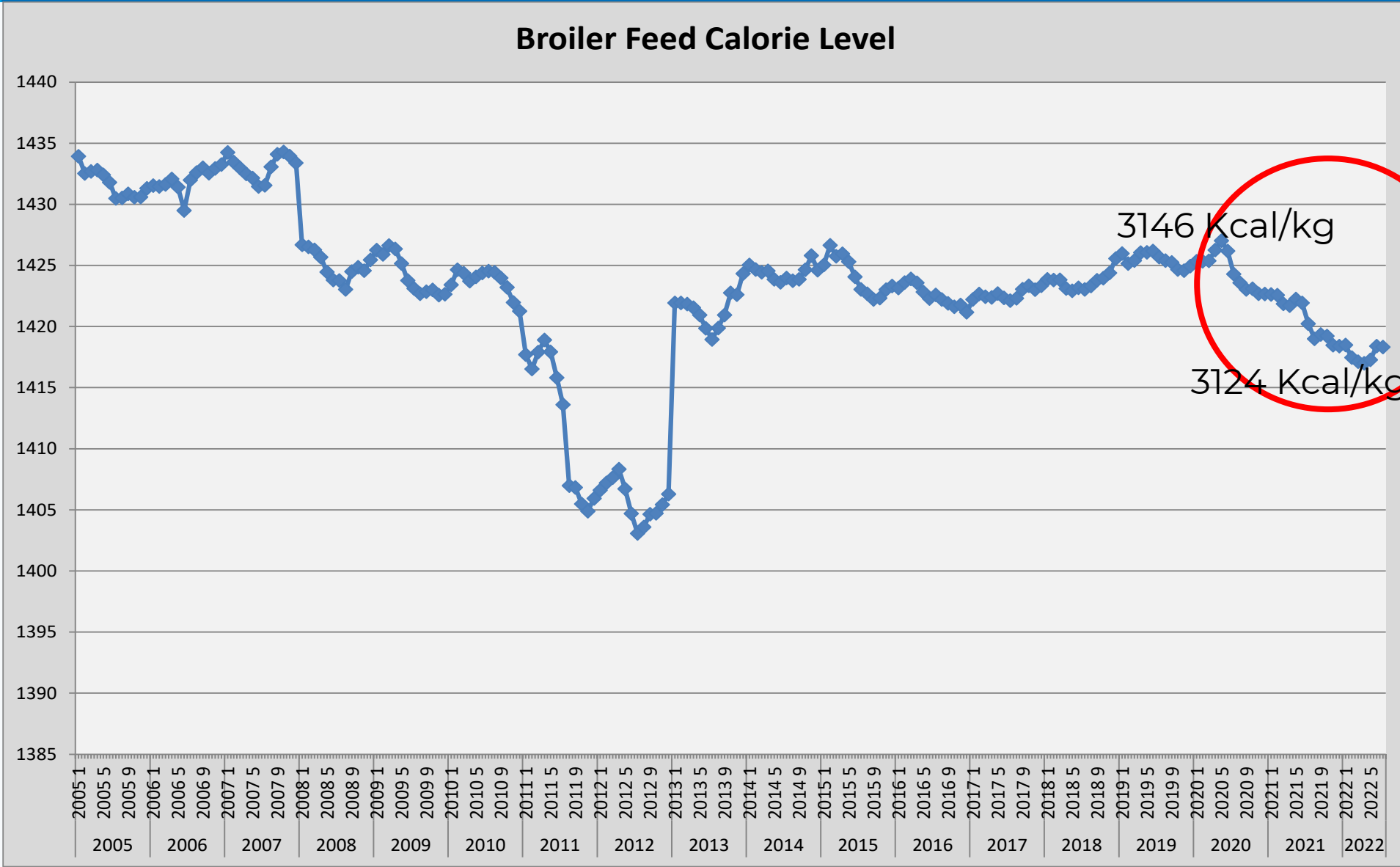
BROILERS



Broiler Feed Cost Per Ton

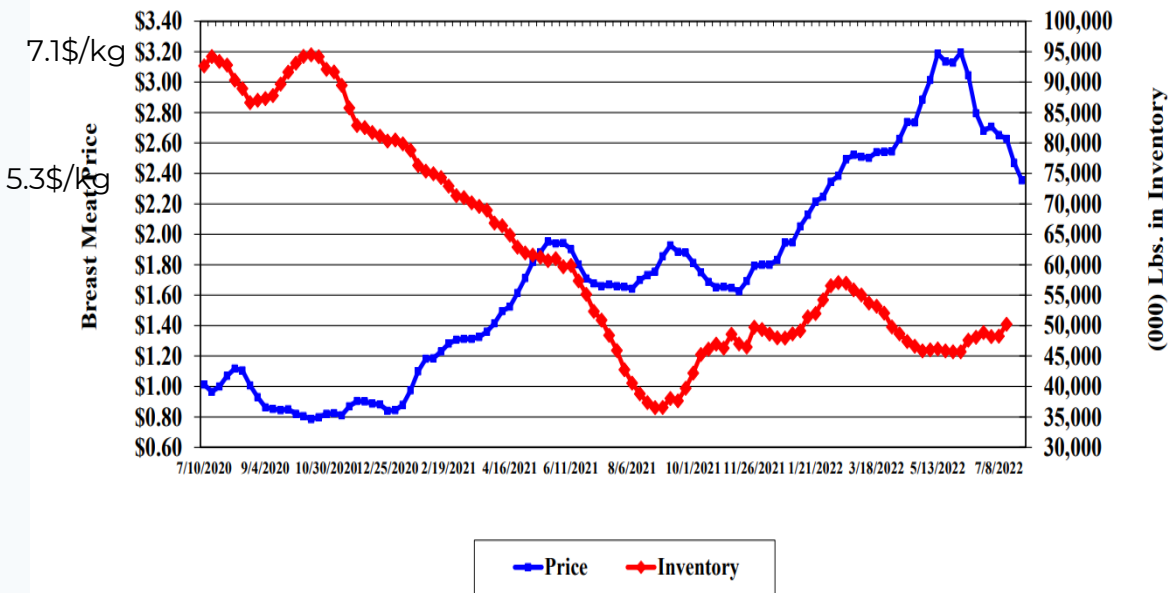


Energy in Broiler Feeds dropped with high Price ingredients

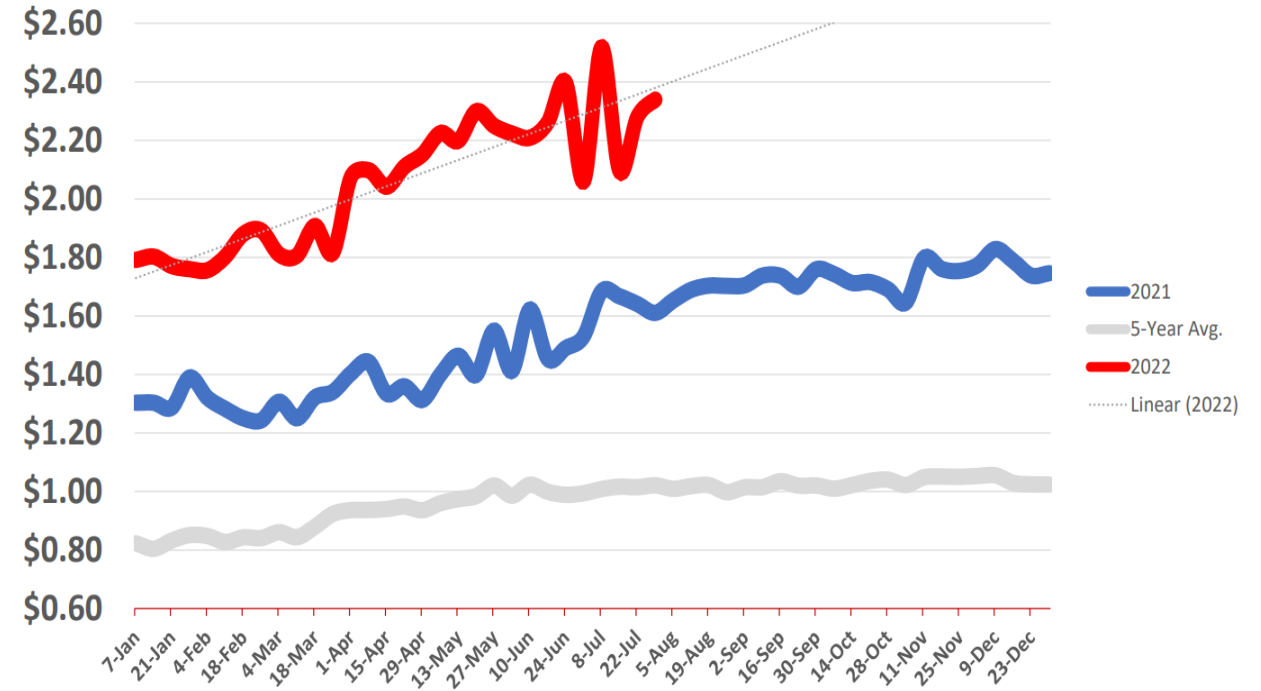


Higher feed cost but high product price

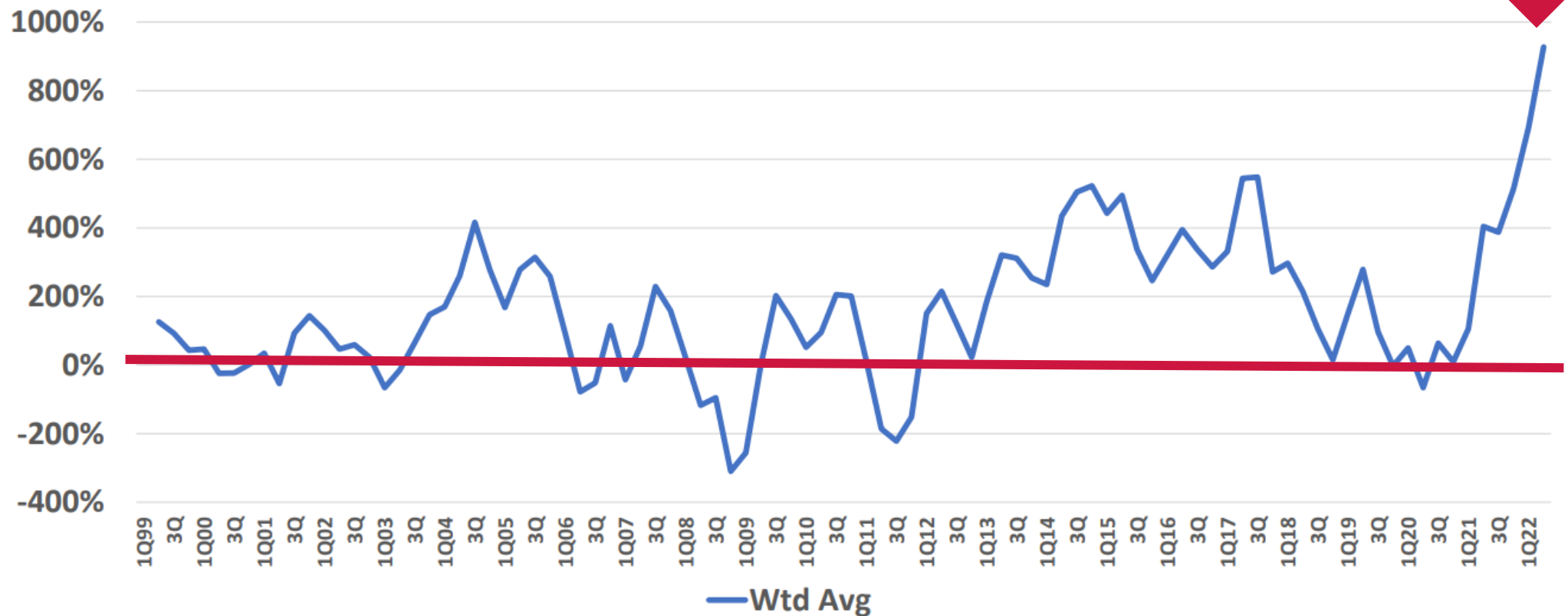
Relationship between Frozen Inventory Levels and Price Levels : Boneless Breast Meat



Paw Price: Average of Medium, Large & Jumbo / A, B, & C Grade / ¢ per Lb.

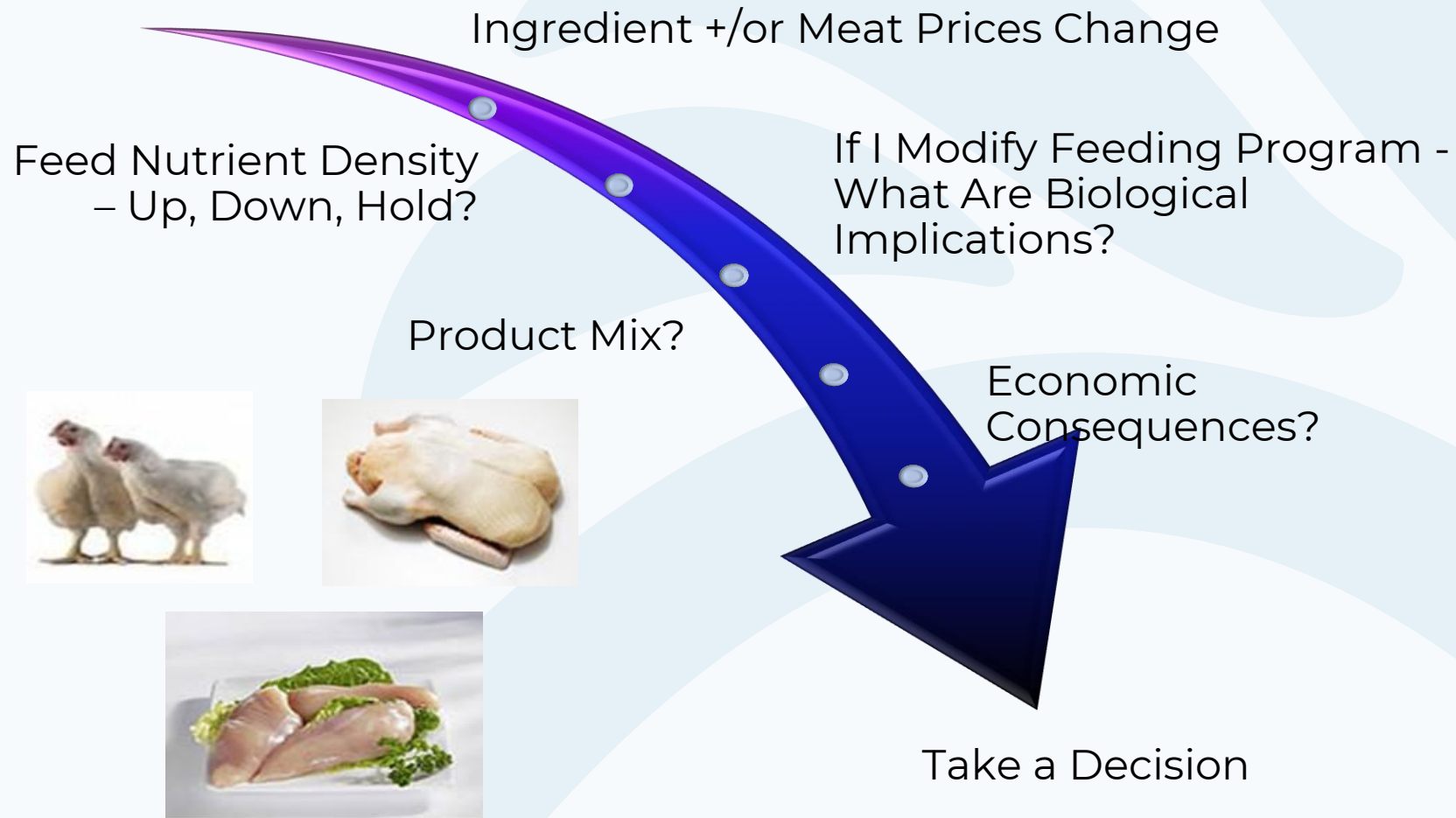


Industry Bottom Line Profit Cents/Live Lb. 1999 through 2022 as a % of the returns in the first quarter of 1999

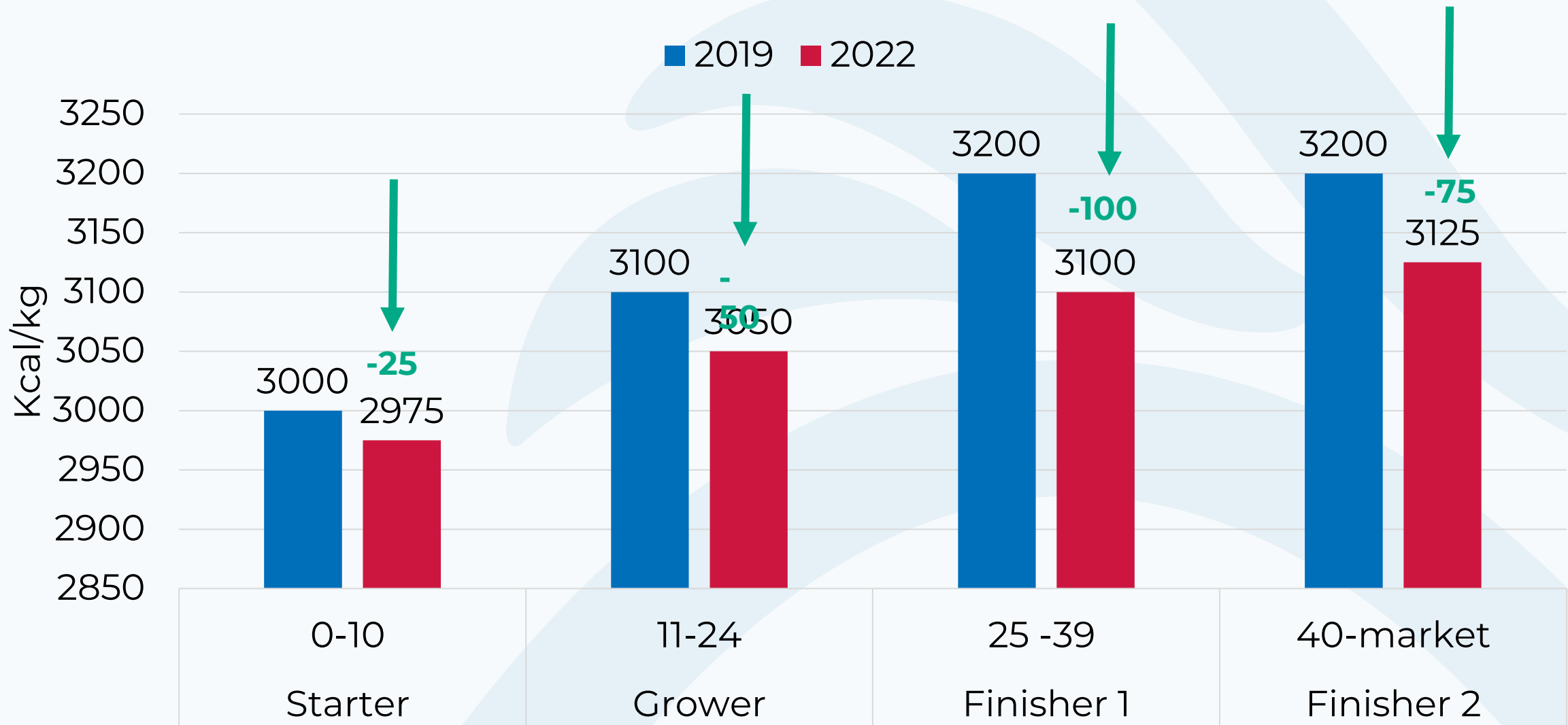


What do you need to ask yourself?

Responding to the Marketplace



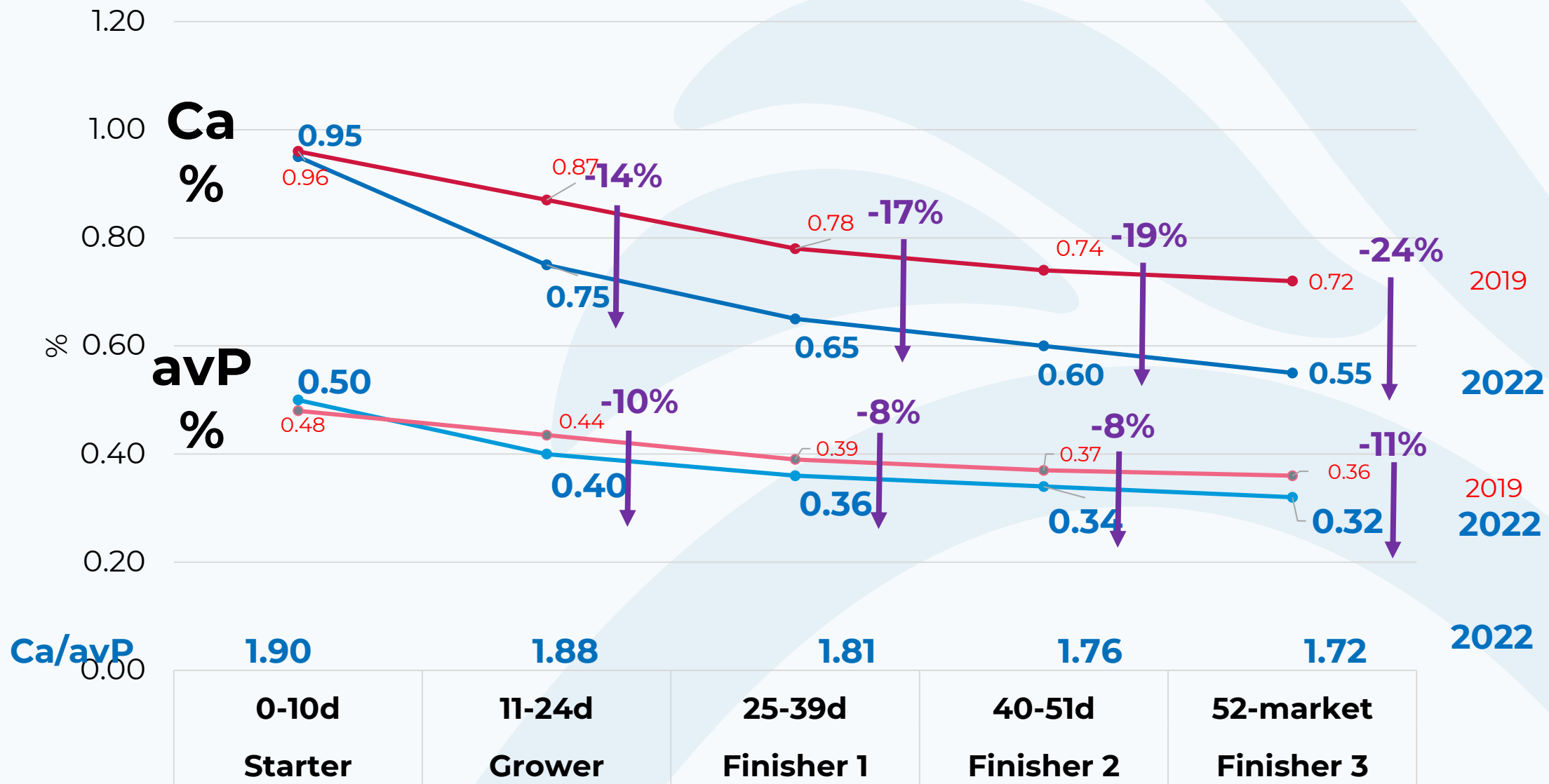
Aviagen 2022 Energy Recommendations



Aviagen 2022 Amino Acid Recommendations

AMINO ACIDS*		Starter			Grower			Finisher 1			Finisher 2		
		2019	2022	Dif.	2019	2022	Dif.	2019	2022	Dif.	2019	2022	Dif.
Lysine	%	1.28	1.32	103%	1.15	1.18	103%	1.02	1.08	106%	0.96	1.02	106%
M+C	%	0.95	1.00	105%	0.87	0.92	106%	0.8	0.86	108%	0.75	0.82	109%
Methionine	%	0.51	0.55	108%	0.47	0.51	109%	0.43	0.48	112%	0.40	0.45	113%
Threonine	%	0.86	0.88	103%	0.77	0.79	103%	0.7	0.72	106%	0.64	0.68	107%
Valine	%	0.96	1.00	104%	0.87	0.91	105%	0.8	0.84	108%	0.73	0.80	110%
Isoleucine	%	0.86	0.88	103%	0.78	0.80	103%	0.7	0.75	106%	0.66	0.70	107%
Arginine	%	1.37	1.40	102%	1.23	1.27	104%	1.09	1.17	107%	1.03	1.12	109%
Tryptophan	%	0.20	0.21	106%	0.18	0.19	105%	0.16	0.17	108%	0.15	0.16	109%
Leucine	%	1.41	1.45	103%	1.27	1.30	102%	1.12	1.19	106%	1.06	1.12	106%

Aviagen 2022 Recommendations



- Do the formulation with your own ingredients
- Using wheat-barley-canola and some corn and SBM, there is no increase in cost between 2019 and 2022 nutrient recommendation
- You gain Performance and support the new Performance Objectives!
 - How much?

2022 Products and Nutrient Recommendations: BROILERS

308, 308FF, 308AP, 708

<4.4lb
<2.2 kg

4.4 – 7.7 lb
2.0 – 3.5 kg

>7.7 lb
>3.5 kg

BROILER

ROSS

Nutrition Specifications

2022



ROSS BROILER: Nutrition Specifications

Table 1: Nutrition Specifications for As-Hatched Broilers - Target Live Weight ≤2.0 kg (≤4.4 lb).

Age Fed	days	Starter	Grower	Finisher
Energy per kg		0-10	11-24	25-market
	kcal	2975	3050	3100
	MJ	12.4	12.8	13.0
Energy per lb		1349	1383	1406
DIGESTIBLE AMINO ACIDS¹				
Lysine	%	1.32	1.18	1.08
Methionine + Cysteine	%	1.00	0.92	0.86
Methionine	%	0.55	0.51	0.48
Threonine	%	0.88	0.79	0.72
Valine	%	1.00	0.91	0.84
Isoleucine	%	0.88	0.80	0.75
Arginine	%	1.40	1.27	1.17
Tryptophan	%	0.21	0.19	0.17
Leucine	%	1.45	1.30	1.19
Crude Protein ²	%	23.0	21.5	19.5
MINERALS				
Total Calcium	%	0.95	0.75	0.65
Available Phosphorus	%	0.50	0.42	0.36
Magnesium	%	0.05-0.30	0.05-0.30	0.05-0.30
Sodium	%	0.18-0.23	0.18-0.23	0.18-0.23
Chloride	%	0.18-0.23	0.18-0.23	0.18-0.23
Potassium	%	0.60-0.90	0.60-0.90	0.60-0.90
ADDED TRACE MINERALS PER KG				
Copper	mg	16	16	16
Iodine	mg	1.25	1.25	1.25
Iron	mg	20	20	20
Manganese	mg	120	120	120
Selenium	mg	0.30	0.30	0.30
Zinc	mg	120	120	120
ADDED VITAMINS PER KG				
Vitamin A	IU	13000	11000	10000
Vitamin D ₃	IU	5000	4500	4000
Vitamin E	IU	80	65	55
Vitamin K (Menadiolone)	mg	4.0	3.6	3.2
Thiamin (B ₁)	mg	5	4	3
Riboflavin (B ₂)	mg	9	8	7
Niacin	mg	70	65	50
Pantothenic Acid	mg	25	20	15
Pyridoxine (B ₆)	mg	5	4	3
Biotin	mg	0.35	0.28	0.22
Folic Acid	mg	2.5	2.0	1.8
Vitamin B ₁₂	mg	0.02	0.018	0.016
MINIMUM SPECIFICATION				
Choline per kg	mg	1700	1600	1500
Linoleic Acid	%	1.25	1.20	1.00

¹ To achieve the listed amino acid levels, adopting the use of either feed-grade amino acids or more complex diets may be necessary.

² Formulation should focus on achieving an adequate amino acid profile. These crude protein levels are not a requirement per se but instead are levels that can likely be achieved in corn/soybean meal-based diets and ensure a functional pool of non-essential amino acids.

NOTES: These feed specifications should be used as a guide only. Adjustments may be necessary for local conditions, legislation and markets. A withdrawal feed should be fed to meet local requirements for medication withdrawal times and can be formulated to the same standards as the final feed listed above.

ROSS BROILER: Nutrition Specifications

Table 2: Nutrition Specifications for As-Hatched Broilers - Target Live Weight 2.0 - 3.5 kg (3.75 - 5.3

Age Fed	days	Starter	Grower	Finisher 1	Finisher 2
Energy per kg		0-10	11-24	25-39	40-market
	kcal	2975	3050	3100	3125
	MJ	12.4	12.8	13.0	13.1
Energy per lb		1349	1383	1406	1417
DIGESTIBLE AMINO ACIDS¹					
Lysine	%	1.32	1.18	1.08	1.02
Methionine + Cysteine	%	1.00	0.92	0.86	0.82
Methionine	%	0.55	0.51	0.48	0.45
Threonine	%	0.88	0.79	0.72	0.68
Valine	%	1.00	0.91	0.84	0.80
Isoleucine	%	0.88	0.80	0.75	0.70
Arginine	%	1.40	1.27	1.17	1.12
Tryptophan	%	0.21	0.19	0.17	0.16
Leucine	%	1.45	1.30	1.19	1.12
Crude Protein ²	%	23.0	21.5	19.5	18.0
MINERALS					
Total Calcium	%	0.95	0.75	0.65	0.60
Available Phosphorus	%	0.50	0.42	0.36	0.34
Magnesium	%	0.05-0.30	0.05-0.30	0.05-0.30	0.05-0.30
Sodium	%	0.18-0.23	0.18-0.23	0.18-0.23	0.18-0.23
Chloride	%	0.18-0.23	0.18-0.23	0.18-0.23	0.18-0.23
Potassium	%	0.60-0.90	0.60-0.90	0.60-0.90	0.60-0.90
ADDED TRACE MINERALS PER KG					
Copper	mg	16	16	16	16
Iodine	mg	1.25	1.25	1.25	1.25
Iron	mg	20	20	20	20
Manganese	mg	120	120	120	120
Selenium	mg	0.30	0.30	0.30	0.30
Zinc	mg	120	120	120	120
ADDED VITAMINS PER KG					
Vitamin A	IU	13000	11000	10000	10000
Vitamin D ₃	IU	5000	4500	4000	4000
Vitamin E	IU	80	65	55	55
Vitamin K (Menadiolone)	mg	4.0	3.6	3.2	3.2
Thiamin (B ₁)	mg	5	4	3	3
Riboflavin (B ₂)	mg	9	8	7	7
Niacin	mg	70	65	50	50
Pantothenic Acid	mg	25	20	15	15
Pyridoxine (B ₆)	mg	5	4	3	3
Biotin	mg	0.35	0.28	0.22	0.22
Folic Acid	mg	2.5	2.0	1.8	1.8
Vitamin B ₁₂	mg	0.02	0.018	0.016	0.016
MINIMUM SPECIFICATION					
Choline per kg	mg	1700	1600	1500	1450
Linoleic Acid	%	1.25	1.20	1.00	1.00

¹ To achieve the listed amino acid levels, adopting the use of either feed-grade amino acids or more complex diets may be necessary. Formulation should focus on achieving an adequate amino acid profile. These crude protein levels are not a requirement per se but instead are levels that can likely be achieved in corn/soybean meal-based diets and ensure a functional pool of non-essential amino acids.

NOTES: These feed specifications should be used as a guide only. Adjustments may be necessary for local conditions, legislation and markets. A withdrawal feed should be fed to meet local requirements for medication withdrawal times and can be formulated to the same standards as the final feed listed above.

ROSS BROILER: Nutrition Specifications

Table 3: Nutrition Specifications for As-Hatched Broilers - Target Live Weight >3.5 kg (>7.7 lb).

Age Fed	days	Starter	Grower	Finisher 1	Finisher 2	Finisher 3
Energy per kg		0-10	11-24	25-39	40-51	52-market
	kcal	2975	3050	3100	3125	3150
	MJ	12.4	12.8	13.0	13.1	13.2
Energy per lb		1349	1383	1406	1417	1429
DIGESTIBLE AMINO ACIDS¹						
Lysine	%	1.32	1.18	1.08	1.02	0.96
Methionine + Cysteine	%	1.00	0.92	0.86	0.82	0.77
Methionine	%	0.55	0.51	0.48	0.45	0.42
Threonine	%	0.88	0.79	0.72	0.68	0.64
Valine	%	1.00	0.91	0.84	0.80	0.77
Isoleucine	%	0.88	0.80	0.75	0.70	0.67
Arginine	%	1.40	1.27	1.17	1.12	1.08
Tryptophan	%	0.21	0.19	0.17	0.16	0.15
Leucine	%	1.45	1.30	1.19	1.12	1.06
Crude Protein ²	%	23.0	21.5	19.5	18.0	17.0
MINERALS						
Total Calcium	%	0.95	0.75	0.65	0.60	0.55
Available Phosphorus	%	0.50	0.42	0.36	0.34	0.32
Magnesium	%	0.05-0.30	0.05-0.30	0.05-0.30	0.05-0.30	0.05-0.30
Sodium	%	0.18-0.23	0.18-0.23	0.18-0.23	0.18-0.23	0.18-0.23
Chloride	%	0.18-0.23	0.18-0.23	0.18-0.23	0.18-0.23	0.18-0.23
Potassium	%	0.60-0.90	0.60-0.90	0.60-0.90	0.60-0.90	0.60-0.90
ADDED TRACE MINERALS PER KG						
Copper	mg	16	16	16	16	16
Iodine	mg	1.25	1.25	1.25	1.25	1.25
Iron	mg	20	20	20	20	20
Manganese	mg	120	120	120	120	120
Selenium	mg	0.30	0.30	0.30	0.30	0.30
Zinc	mg	120	120	120	120	120
ADDED VITAMINS PER KG						
Vitamin A	IU	13000	11000	10000	10000	10000
Vitamin D ₃	IU	5000	4500	4000	4000	4000
Vitamin E	IU	80	65	55	55	55
Vitamin K (Menadiolone)	mg	4.0	3.6	3.2	3.2	3.2
Thiamin (B ₁)	mg	5	4	3	3	3
Riboflavin (B ₂)	mg	9	8	7	7	7
Niacin	mg	70	65	50	50	50
Pantothenic Acid	mg	25	20	15	15	15
Pyridoxine (B ₆)	mg	5	4	3	3	3
Biotin	mg	0.35	0.28	0.22	0.22	0.22
Folic Acid	mg	2.5	2.0	1.8	1.8	1.8
Vitamin B ₁₂	mg	0.02	0.018	0.016	0.016	0.016
MINIMUM SPECIFICATION						
Choline per kg	mg	1700	1600	1500	1450	1450
Linoleic Acid	%	1.25	1.20	1.00	1.00	1.00

¹ To achieve the listed amino acid levels, adopting the use of either feed-grade amino acids or more complex diets may be necessary. Formulation should focus on achieving an adequate amino acid profile. These crude protein levels are not a requirement per se but instead are levels that can likely be achieved in corn/soybean meal-based diets and ensure a functional pool of non-essential amino acids.

NOTES: These feed specifications should be used as a guide only. Adjustments may be necessary for local conditions, legislation and markets. A withdrawal feed should be fed to meet local requirements for medication withdrawal times and can be formulated to the same standards as the final feed listed above.

BEEP Broiler Economics for Energy and Protein

- Nutritionists alter nutrient density in response
 - Feed Cost benchmarking
 - Need of improving performance
 - Need of Balancing Cost and Market price

- Resulting in a change in Margin over feed cost (MOFC)
 - $MOFC = \text{Revenue (live bird or meat)} - \text{Costs (feed)}$
 - Outcome depends on product: whole bird, portioning

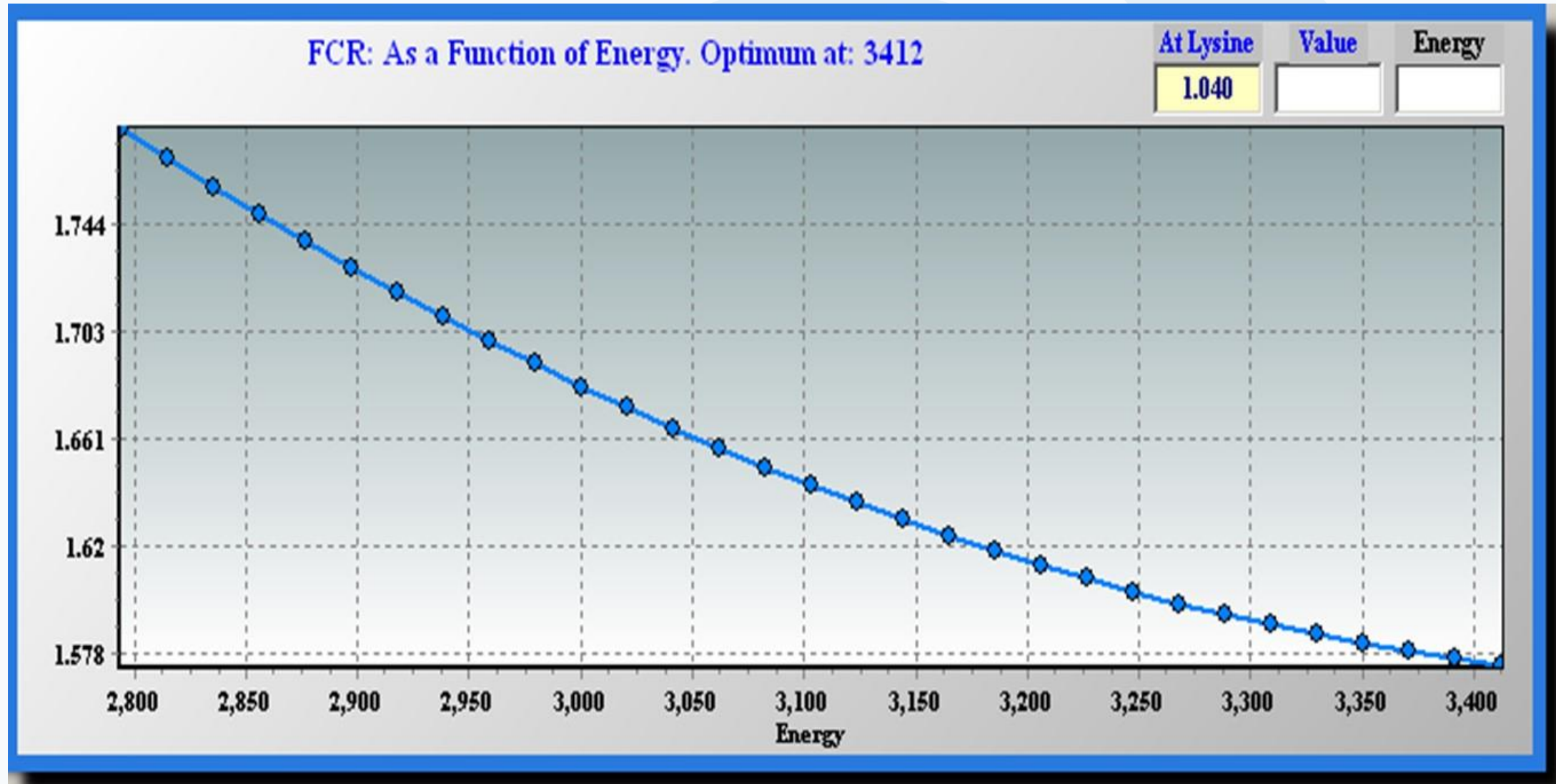


Describe Broiler Biological Response

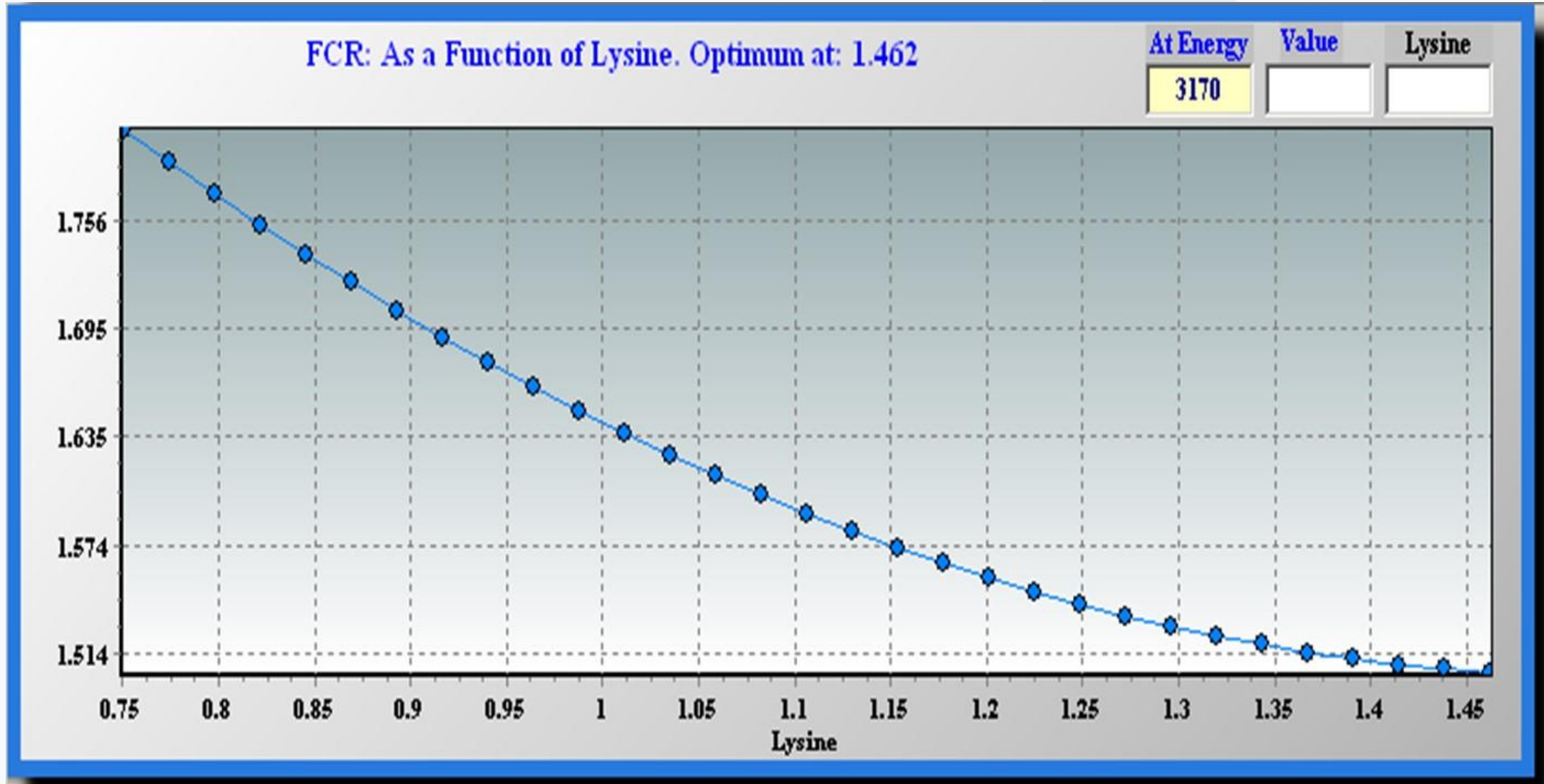
- Combine research data
 - 16 experiments
 - ~ 106,000 broilers
 - Reared sex-separate
 - 8 strain crosses included
 - Wide weight range tested (1.09 – 4.70 kg)
 - Wide range of dietary energy and amino acid levels tested

Diet	Dietary Energy (kcal ME/kg)		Dietary Lysine (% Dig)	
	Min	Max	Min	Max
1	2723	3176	0.89	1.65
2	2761	3308	0.77	1.43
3	2802	3360	0.62	1.26
4	2903	3386	0.68	1.13

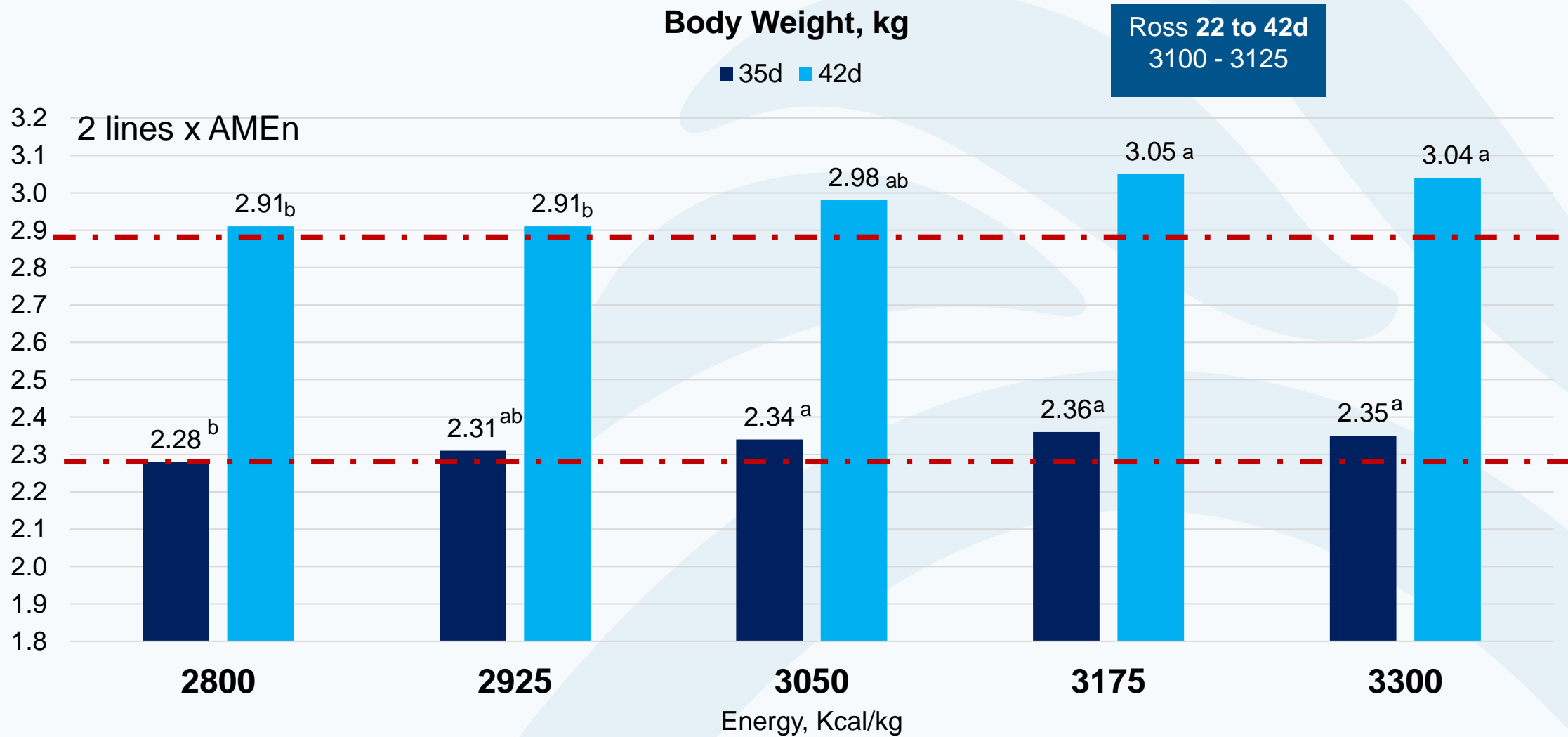
FCR Response to Energy at a Given Lysine Level



FCR Response to Lysine at a Given Energy Level

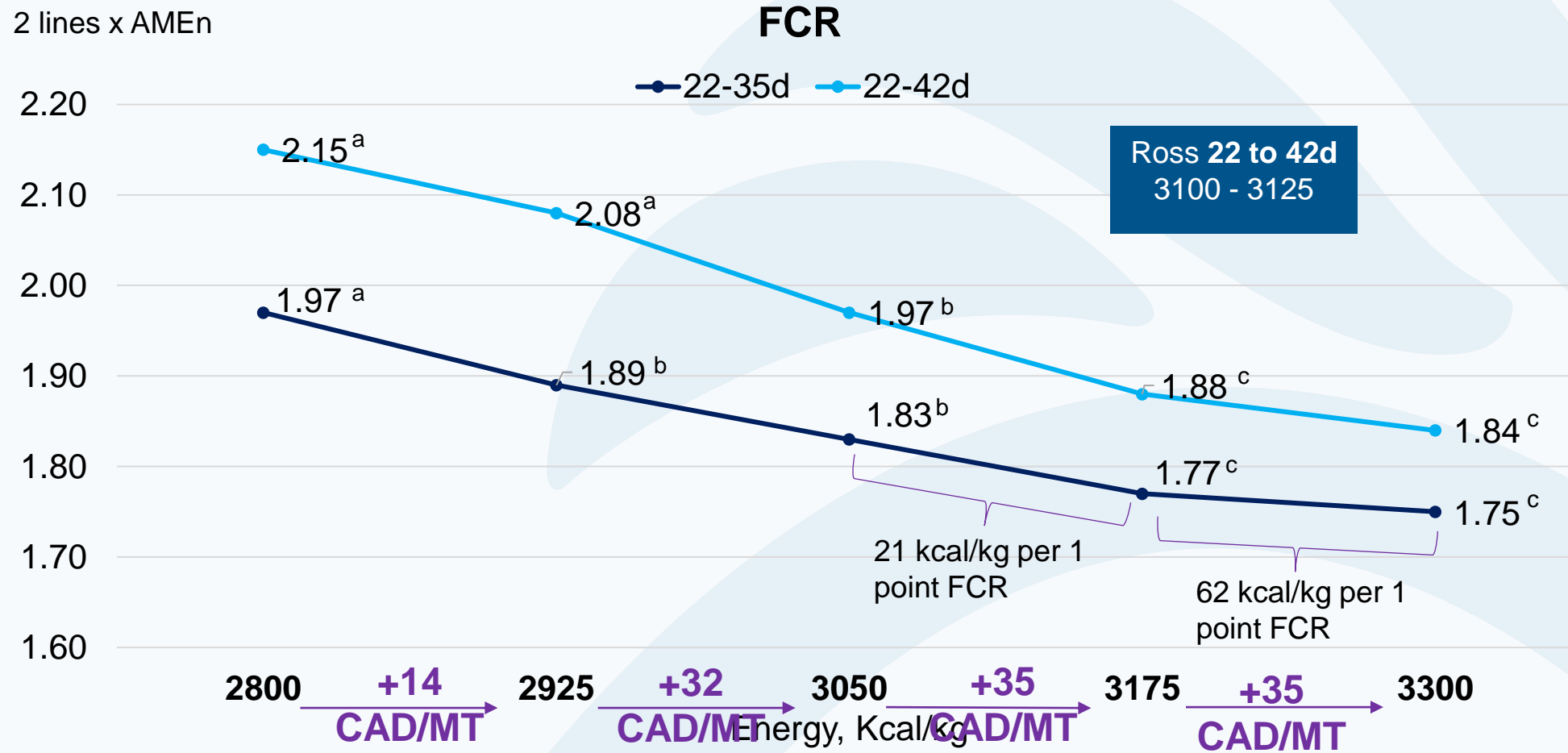


Effect of Increased AMEn 22 to 42d on BW at 35 and 42d



Source: Evonik and U. Of Arkansas, 2018

Effect of Increased AMEn 22 to 42d on FCR 22 to 35d and 22 to 42d



Source: Maharjan et al., 2021

Cost Calculated high cost scenario

308AP Body Weight Optimization (g) – 41d Males

ME	BP																								
	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112	114	116	118	120	122	124	126	128
91	2581	2642	2700	2754	2805	2852	2895	2934	2970	3002	3031	3056	3077	3095	3109	3119	3126	3129	3128	3124	3116	3105	3090	3071	3048
92	2590	2652	2711	2766	2817	2864	2908	2948	2985	3018	3047	3073	3095	3113	3128	3139	3146	3150	3150	3147	3139	3128	3114	3096	3074
93	2598	2661	2720	2775	2827	2875	2920	2961	2998	3032	3062	3088	3111	3130	3145	3157	3165	3169	3170	3167	3160	3150	3136	3119	3098
94	2604	2667	2727	2783	2836	2884	2930	2971	3009	3043	3074	3101	3124	3144	3160	3172	3181	3186	3188	3185	3180	3170	3157	3140	3120
95	2607	2671	2732	2789	2842	2892	2937	2980	3018	3053	3085	3112	3136	3157	3173	3186	3196	3201	3204	3202	3197	3188	3176	3159	3140
96	2609	2674	2735	2793	2847	2897	2943	2986	3026	3061	3093	3121	3146	3167	3185	3198	3208	3215	3218	3217	3212	3204	3192	3177	3158
97	2609	2675	2736	2795	2849	2900	2947	2991	3031	3067	3100	3129	3154	3176	3194	3208	3219	3226	3230	3230	3226	3218	3207	3192	3174
98	2607	2673	2736	2795	2850	2901	2949	2994	3034	3071	3105	3134	3160	3183	3201	3217	3228	3236	3240	3240	3237	3230	3220	3206	3188
99	2603	2670	2733	2793	2849	2901	2950	2995	3036	3073	3108	3138	3165	3188	3207	3223	3235	3243	3248	3249	3247	3241	3231	3218	3200
100	2598	2665	2729	2789	2846	2899	2948	2993	3035	3074	3108	3140	3167	3191	3211	3227	3240	3249	3255	3256	3255	3249	3240	3227	3211
101	2590	2658	2723	2783	2841	2894	2944	2991	3033	3072	3108	3139	3167	3192	3212	3230	3243	3253	3259	3262	3260	3256	3247	3235	3219
102	2580	2649	2714	2776	2834	2888	2939	2986	3029	3069	3105	3137	3166	3191	3212	3230	3244	3255	3262	3265	3264	3260	3252	3241	3226
103	2569	2638	2704	2766	2825	2880	2931	2979	3023	3063	3100	3133	3162	3188	3210	3229	3244	3255	3262	3266	3266	3263	3256	3245	3231
104	2555	2626	2692	2755	2814	2870	2922	2970	3015	3056	3093	3127	3157	3184	3206	3226	3241	3253	3261	3266	3266	3264	3257	3247	3234
105	2540	2611	2678	2742	2802	2858	2911	2960	3005	3047	3085	3119	3150	3177	3201	3220	3237	3249	3258	3263	3258	3263	3257	3248	3234
106	2523	2594	2662	2727	2787	2844	2897	2947	2993	3036	3074	3109	3141	3169	3193	3213	3230	3243	3253	3259	3261	3260	3255	3246	3233
107	250	2576	2645	2709	2771	2828	2882	2933	2979	3023	3062	3098	3130	3158	3183	3204	3222	3236	3246	3252	3255	3255	3250	3242	3231

308AP Summary 42d

- BWG and FCR favored higher levels of ME and BP
 - 308AP: If BW is priority, a reduced ME&BP diet for females vs males can optimize this parameter and potentially feed cost reduction
- Carcass yield favors lower ME and high BP
- BMY favors lower ME and high BP
- Lowest feed cost per LW is favored by lower ME and higher BP for males, and slightly lower BP for females; however, since price of broiler is good, increasing BP can still optimize margin over feed cost

42d - ME/BP Optimization, %		
Parameter	Males	Females
BW	103/ 119	101/ 116
FCR	106/ 125	106/ 124
FCR adj. 2.5 Kg	108/ 123	108/ 123
Carcass Yield	97/ 116	97/ 117
Breast Yield	94/ 119	94/ 121
Feed Cost, \$/kg LW	94/ 104	96/ 98
MOFC carcass	97/ 112	97/ 108

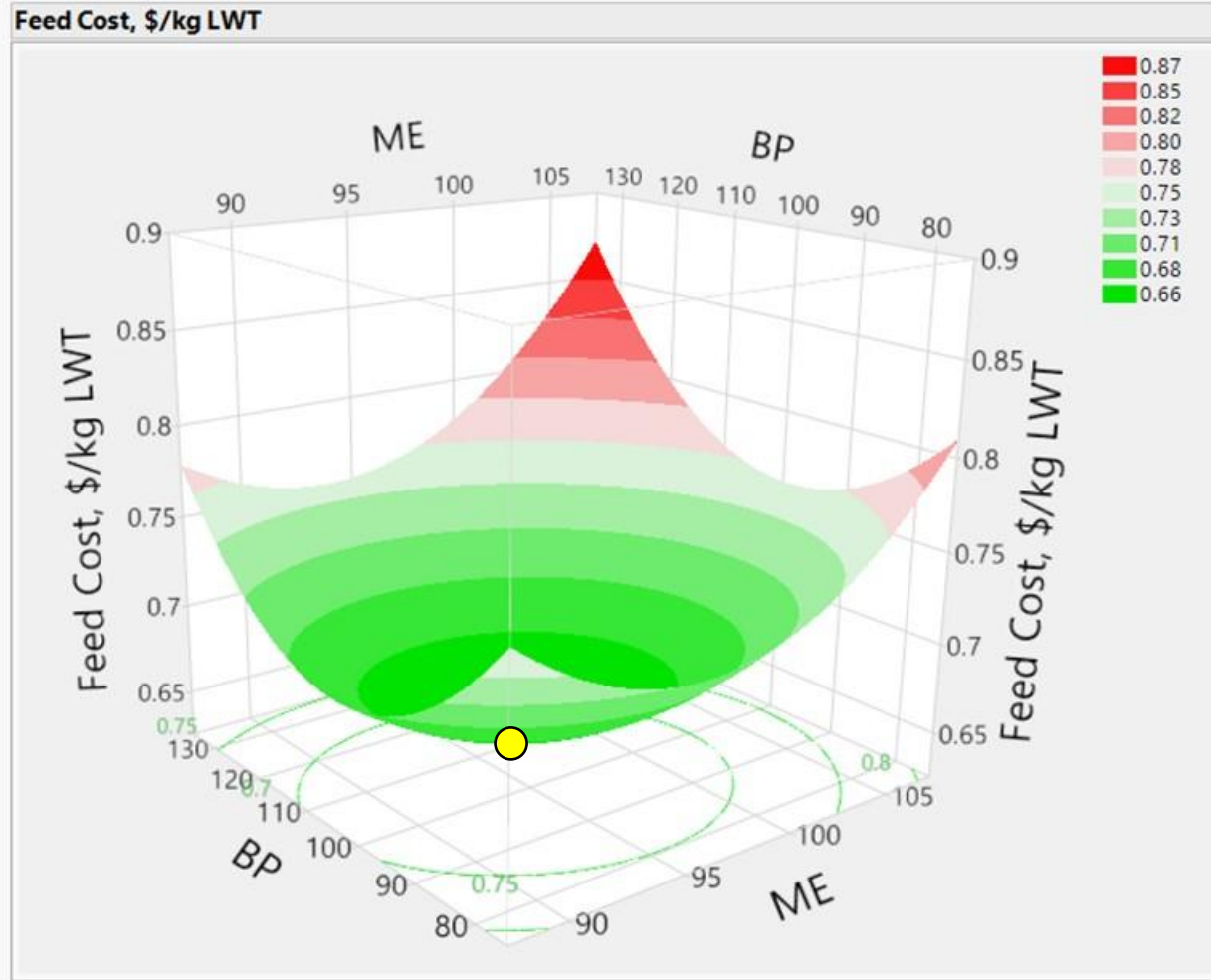
Evaluate Economics

- Calculate feed pricing for respective dietary energy and amino acid levels
 - Ingredient price inputs
 - Allows feed intake cost calculations
- Consider meat value inputs
- Calculate margin over feeding cost (MOFC) and find maximum

$$MOFC = \text{meat output value} - \text{feed input cost}$$

308AP Day 42 - Feed Cost \$/kg LW

Males + Females



Effect Summary

Source	LogWorth	PValue
BP*BP	21.085	0.00000
ME*ME	14.445	0.00000
ME	14.432	0.00000 ^
BP	13.846	0.00000 ^
ME*BP	1.356	0.04409

$R^2 = 0.68$

ME = 95%
BP = 104%

August 2022 Metric Measure

Leg Quarters	\$ 1.32 per kilo
Deboned Breast	\$ 4.97 per kilo
Wings	\$ 2.88 per kilo
Chicago Corn	\$ 252 per ton
Soybean Meal	\$ 487 per ton
Total Wholesale Cost per kilo	\$ 2.33
Revenue per kilo	\$ 2.40

CAD

1.82

6.86

3.97

348

672

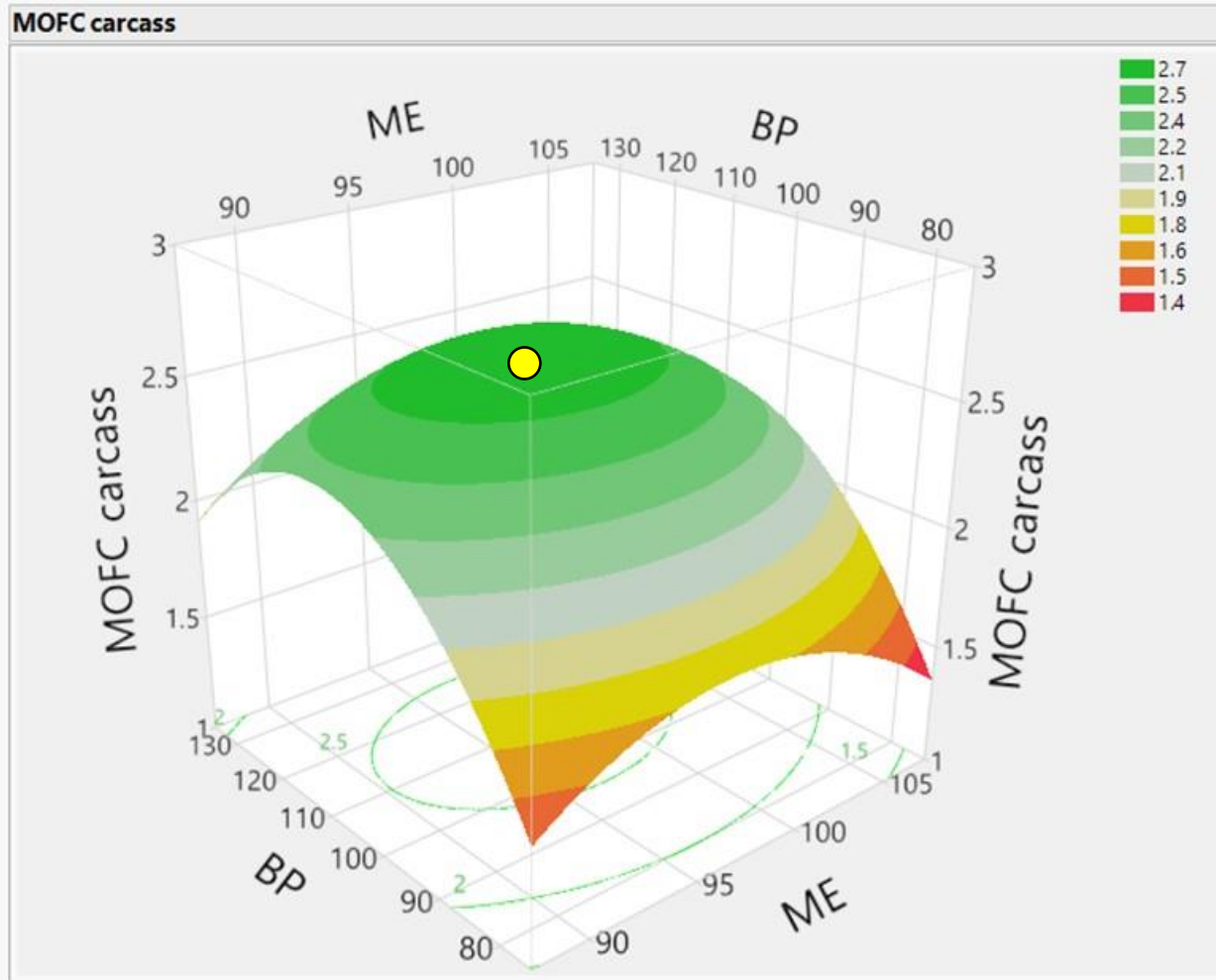
3.22

3.31

Source: Aviagen Broiler Economics by Paul Aho, Vol 30, Issue 4, Aug 2022

308AP Day 42- MOFC, Carcass

Males + Females



Effect Summary

Source	LogWorth	PValue
BP*BP	12.664	0.00000
BP	6.071	0.00000 ^
ME*ME	4.368	0.00004
ME	4.189	0.00006 ^
ME*BP	0.128	0.74448

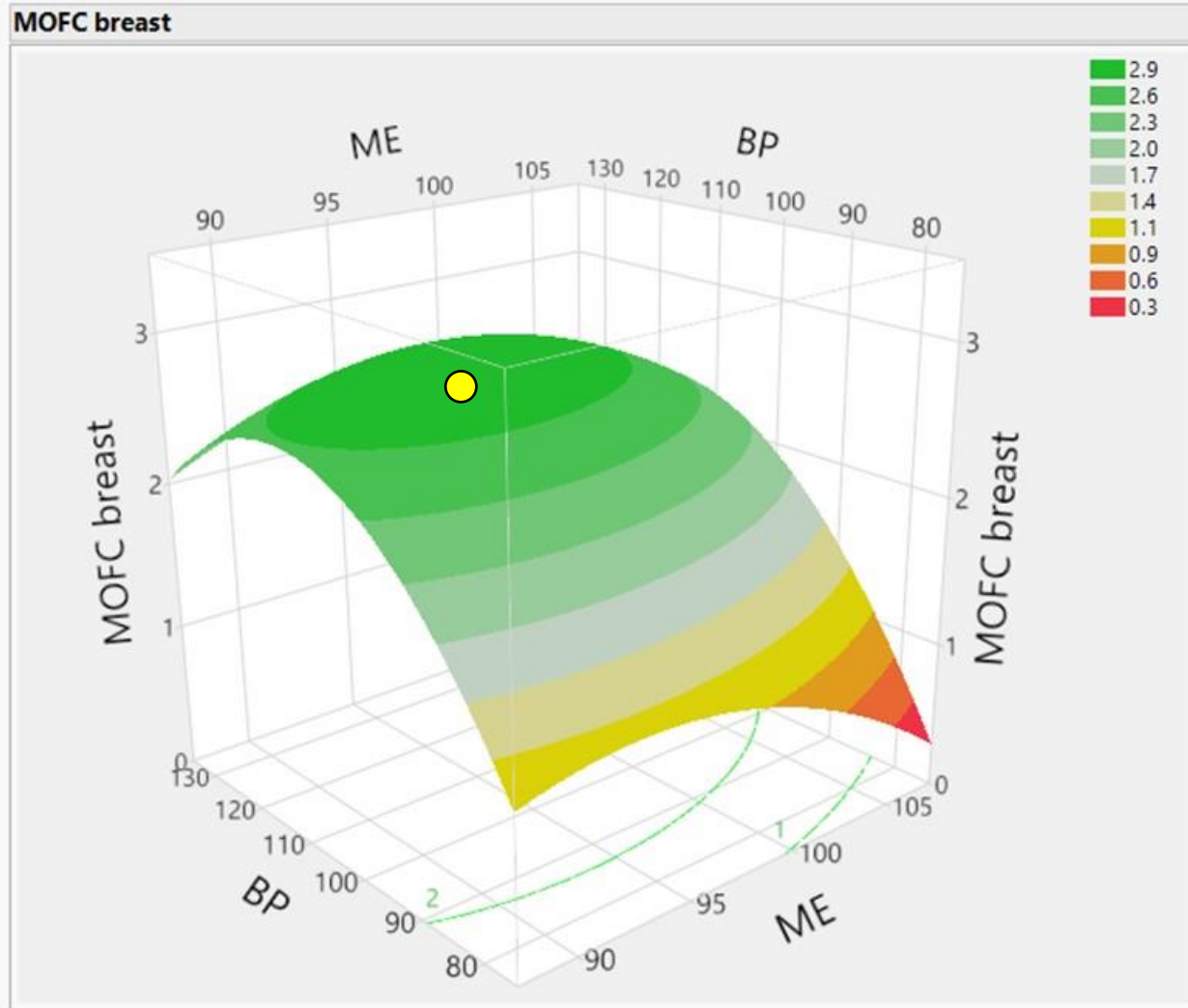
$R^2 = 0.53$

ME = 97%

BP = 112%

Day 42- MOFC, TWM, \$

Males + Females



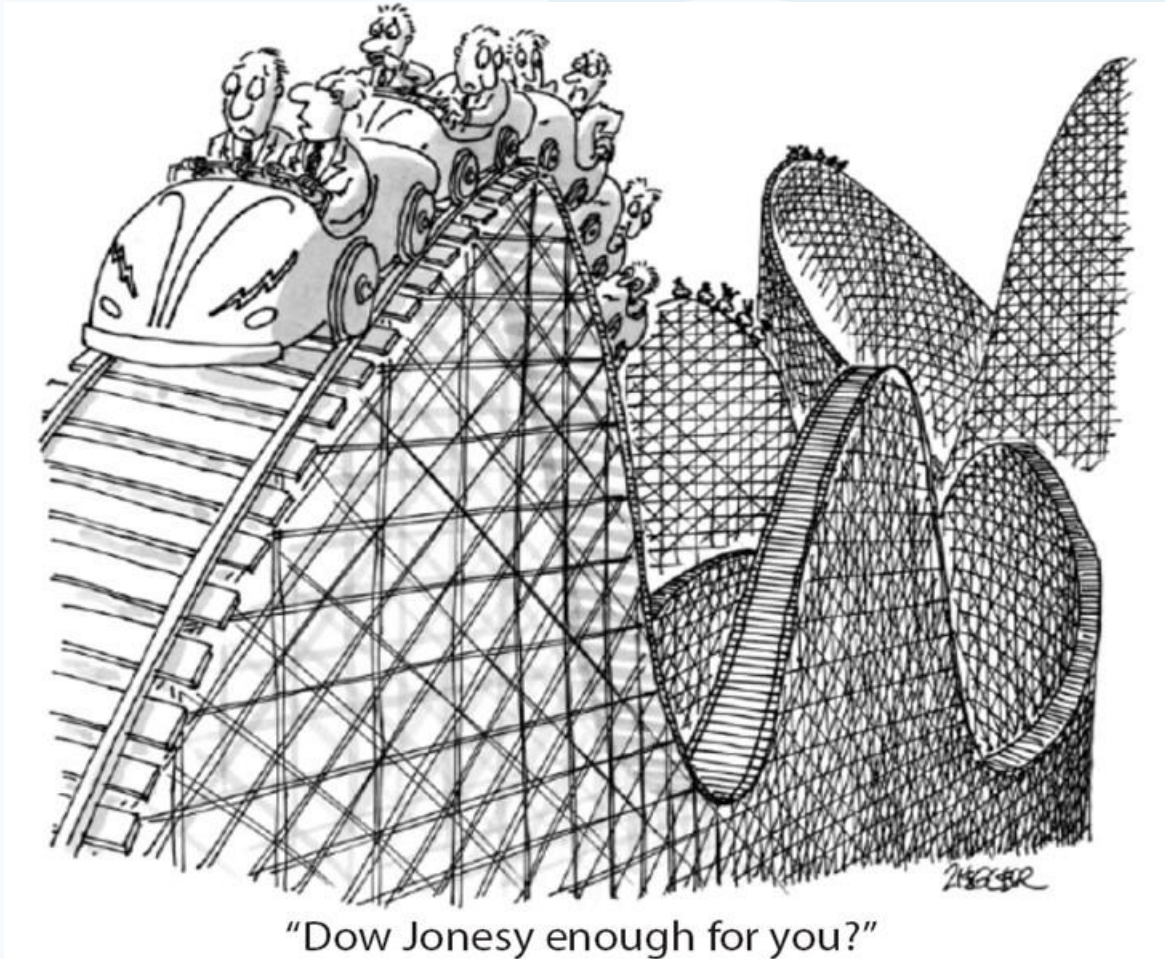
Effect Summary

Source	LogWorth	PValue
BP*BP	24.471	0.00000
BP	9.284	0.00000 ^
ME*ME	6.194	0.00000
ME	5.086	0.00001 ^
ME*BP	2.318	0.00480

$R^2 = 0.86$

ME = 96%
BP = 115%

- *Volatility likely the “new normal”*



- Optimal broiler nutrition strategy?

A moving target!



THANK YOU

jcaldas@aviagen.com



www.aviagen.com