TRANSITION TO COST RATIONALISED POULTRY PRODUCTION

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The farming approach has changed

Farmer centric
past approach

Greater production with least cost – higher profitability – production sustainability – income generation for farmers.

TRANSITION
PHASE

Consumer centric
Present approach

Efficient production – with less cost – consumer consciousness - safe food – premium price – higher margin

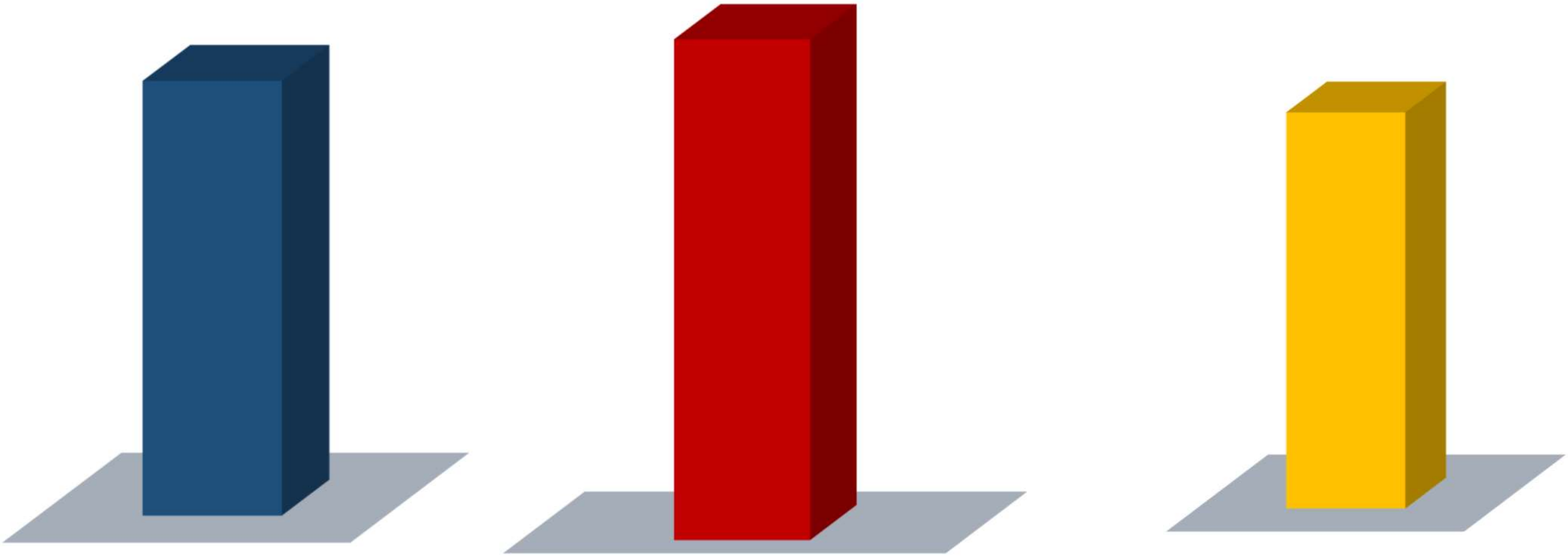
The farming approach has changed

- Emergence of new diseases and new vaccine – knowledge gap
- Vaccination shifting from farm to hatchery
- Manual to automation shift – lack of skilled manpower
- Rising demand of poultry meat consumption

Increasing focus on food safety and animal welfare

It is not FEED it is FOOD

What the chickens can offer…

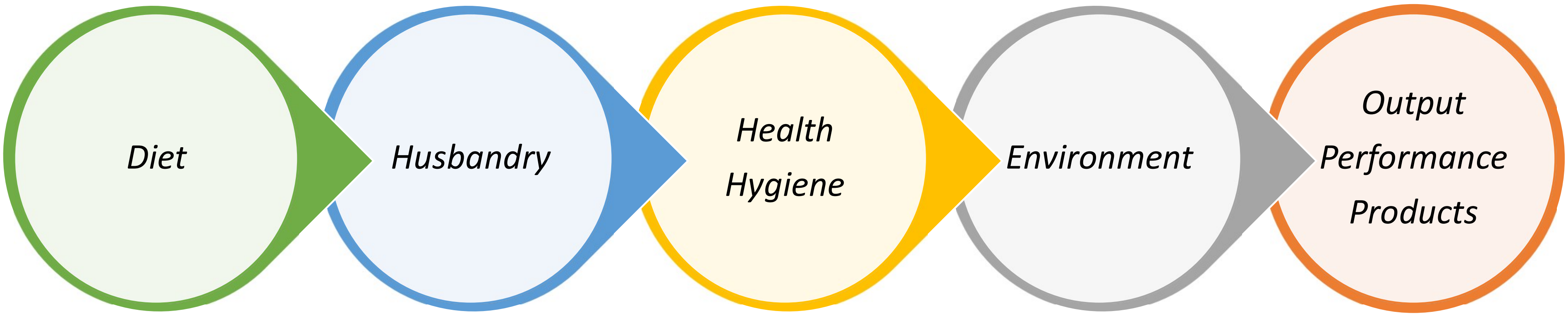


3 kg meat in 40 days

FCR of 1.4 or below

500 eggs in 100 weeks

The input factors



Are we interested to take the full advantage of the genetic potential?

Rationalization – an approach based on informed decision to augment the operational proficiency

Or shall we minimize the input cost to maximize profit?

The diet and the dietary ingredients

Ingredient cost analysis → Nutrient requirement analysis → Formulation modelling → Performance forecasting → Risk evaluation → Flexibility/ Adjustment

Powerful analytical tools → Application of data science → Machine language and AI → Informed decision

Analyzing the nutrient requirements: the "grey" area

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ROSS 308

Year		Protein%	AME kcal/kg	D Lysine %	D M+C %
2014	Starter	23.0	3000	1.28	0.95
Ross	Grower	21.5	3100	1.15	0.87
	Finisher	20.0	3200	1.06	0.83
2022	Starter	23.0	2975	1.32 (+3.1%)	1.00 (5.3%)
Ross	Grower	21.5	3050	1.18 (2.6%)	0.92 (5.7%)
	Finisher	19.5	3100	1.08 (1.9%)	0.86 (3.6%)

COBB 500

Year		Protein%	AME kcal/kg	D Lysine %	D M+C %
2018	Starter	21-22	2975	1.22	0.91
Cobb	Grower	19-20	3025	1.12	0.85
	Finisher	18-19	3100	1.02	0.80
2022	Starter	21-22	2900	1.26	0.94
Cobb	Grower-1	19-20	2950	1.16	0.88
	Grower-2	18-19	3050	1.06	0.82
	Finisher	17-18	3100	0.96	0.74

Analyzing the nutrient requirements: the "grey" area

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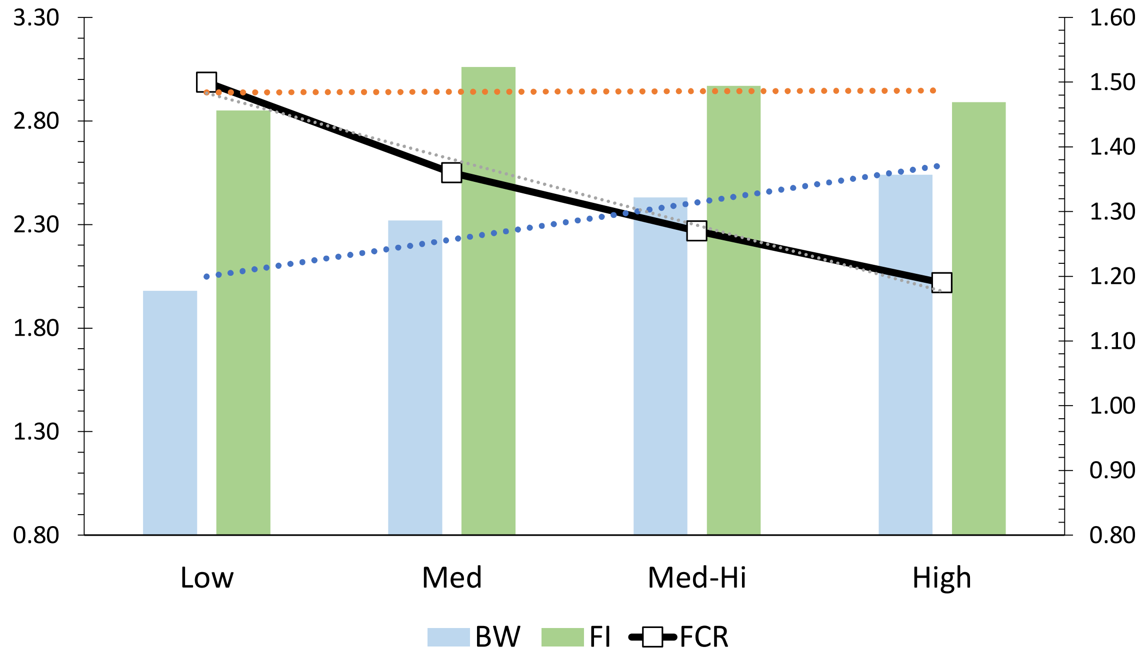
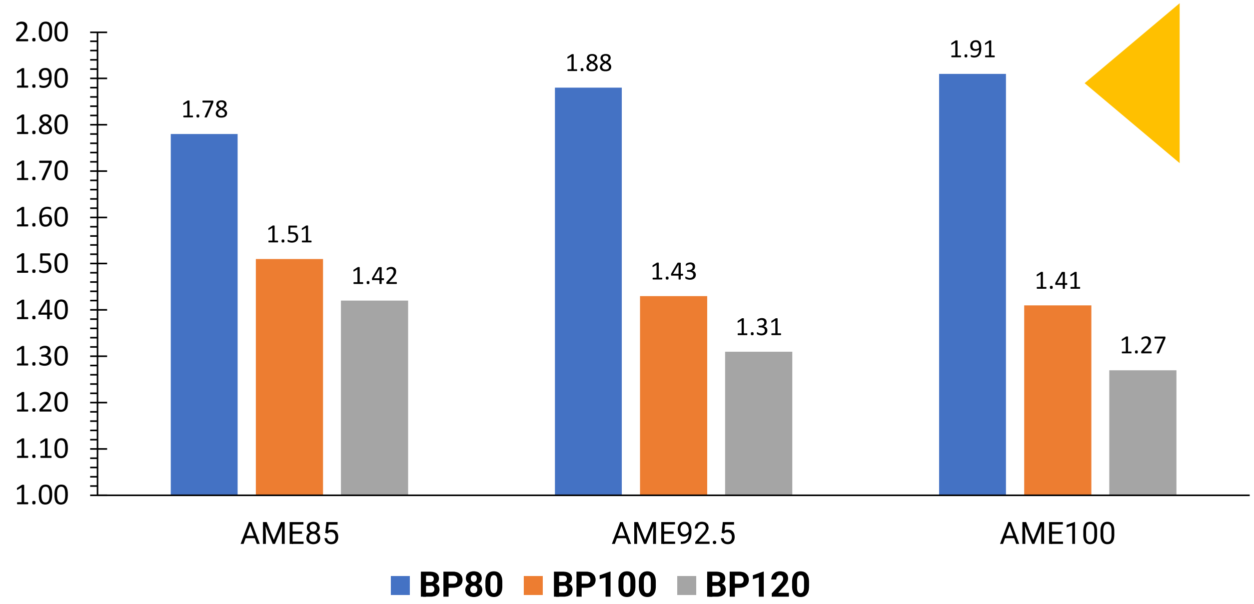
Classical view:
Broiler chickens eat to meet the requirement of the first limiting resource in a diet and attempt to achieve the genetically set maximum growth potential
Broilers adjust their feed intake to maintain a fairly constant intake of energy (and nutrients) and tend to realise a similar gain for age.



Modified view:
Body weight gain and feed efficiency continues to respond to ever increasing nutrient density. Today's broiler perhaps eats to its physical capacity and increased nutrient density resulted in a linear improvement in gain and FE, with no down-regulation of intake

Analyzing the nutrient requirements: the "grey" area



Bird's response in terms of weight corrected FCR in response to dietary AME and Balanced Protein.

The above data and similar experiments indicated that broilers may be less sensitive to reduction in dietary AME from 100 to 92.5% which comes close to 200 kcal/kg.

Low protein diets and the non-essential amino acids

Reduction in dietary protein → Less N available for NEAA → N utilization ratio decreases → Under performance

- The limiting amino acid next to threonine should determine the level of protein in diet.
- Valine ad isoleucine possess an interchangeable position depending on diet ingredient profile.
- Valine may not be optimum with diet containing sub-optimal protein.
- Glycine/serine/glutamic acid may be useful under conditions of physical and physiological stress.
- A combination of VAL + ILE + GLY + GLU may prove beneficial when diet contains inadequate amino nitrogen.

Understanding the requirement

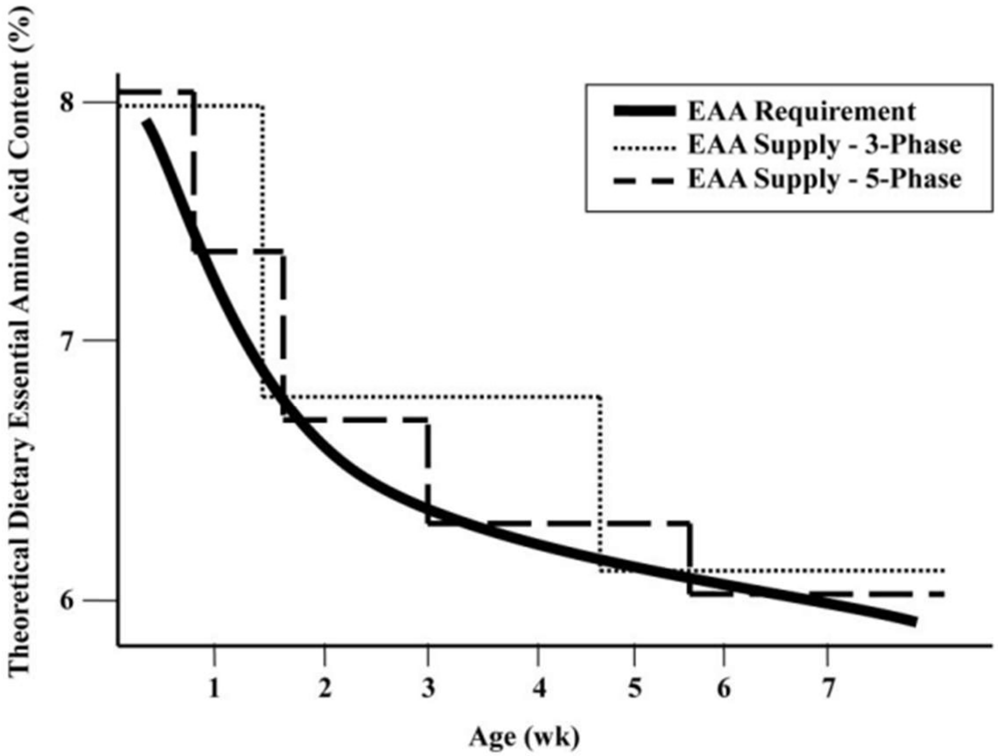


Figure 1. Theoretical relationship of 3-phase and 5-phase feeding programs on the essential amino acid (EAA) supply relative to the EAA requirement in broilers over time (not drawn to scale).

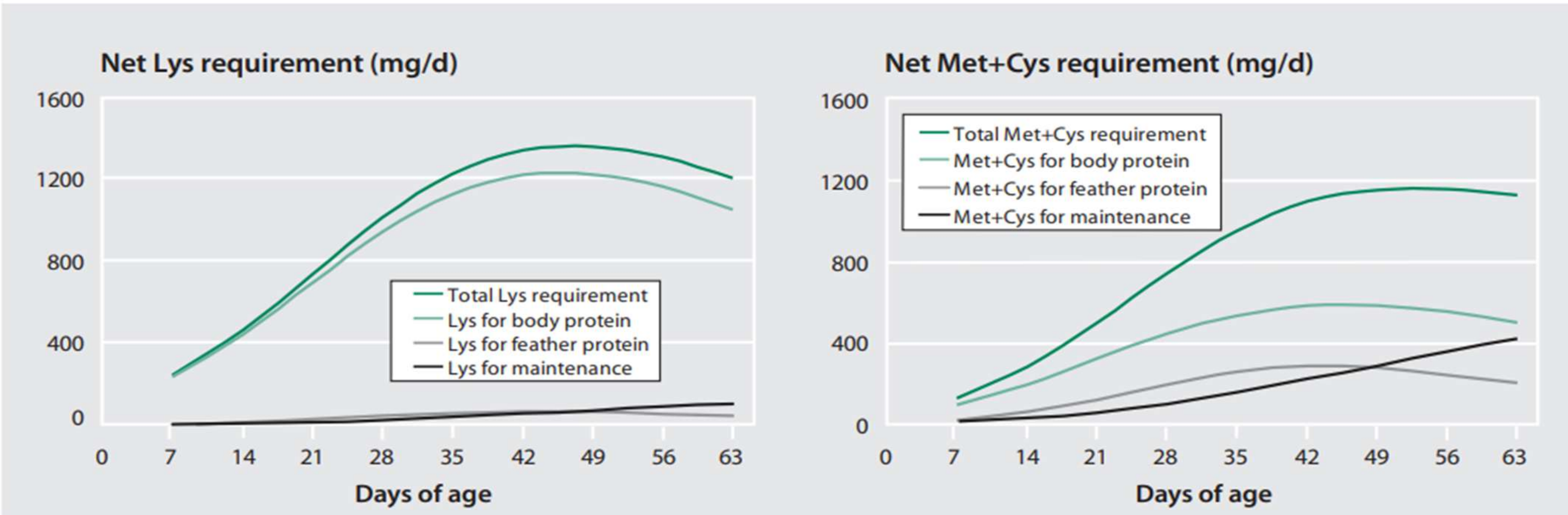
Ideally most rational approach should be meeting the daily requirement of the birds.

Practically it is not possible – the requirement on a given day is a moving target.

A single diet for longer period of time should create underfeeding or overfeeding.

Increasing the number of feeding phases should provide a more rationalized nutrient supply.

Understanding the requirement



Net daily requirement of a nutrient

Feeding behavior and daily feed intake

The absolute quantity of nutrient consumed by the animal

Rational approach towards input cost minimization

Rising conventional feed costs:
Force formulators to seek cost-effective alternatives

Ample availability of unconventional materials:
Offers a competitive advantage

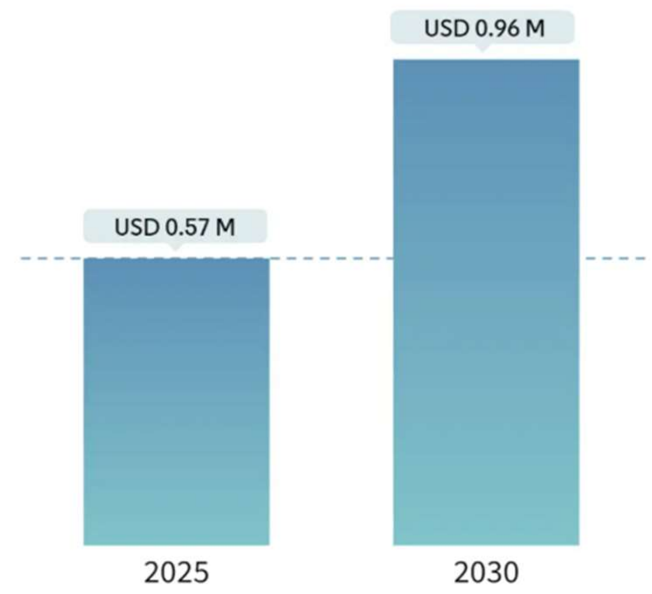
Drop in market price:
Necessitate cost reduction - achieved through the UCF.

Lower “price” may “cost” more: case study DDGS

As ethanol production scales up, a good portion of the maize supply is diverted to ethanol plants.

This diversion reduces the availability of maize for poultry feed, leading to increased prices and supply shortages

DDGS supply likely to see a whopping growth



Lower “price” may “cost” more: case study DDGS

- DDGS can feed a large number of animal species.
- Fermentation makes it rich in protein, energy, vitamins and minerals.
- Destruction of phytic acid by fermentation makes the phosphorus more available.

- Highly variable chemical composition .
- A deficient lysine and methionine profile confounds its acceptability.
- The effect of residual mycotoxins may be devastating.

Lower “price” may “cost” you more: case study DDGS

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CORN

95% 75%

Average (ppb)				
Aflatoxin	DON	Fumonisin	T2	Zearalenone
39	466	3568	62	52

% Contaminated % Above risk

DDGS

99% 19%

Average (ppb)				
Aflatoxin	DON	Fumonisin	T2	Zearalenone
70	1256	4253	235	402

% Contaminated % Above risk

GROUNDNUT BY-PRODUCTS

94% 85%

Average (ppb)				
Aflatoxin	DON	Fumonisin	T2	Zearalenone
68	427	3608	101	187

% Contaminated % Above risk

CORN GLUTEN MEAL

97% 61%

Average (ppb)				
Aflatoxin	DON	Fumonisin	T2	Zearalenone
109	883	9150	87	1070

% Contaminated % Above risk

- *94% of the samples were contaminated with aflatoxin – the average being 50 ppb and the highest value found was 411 ppb.*
- *99% and 92% of the samples had DON and FUM contaminations respectively.*
- *Corn gluten meal and DDGS had exceptionally high incidence of contamination – 97% and 99% respectively.*
- *55% of the samples had co-occurrence of mycotoxins.*
- *Incidences of mycotoxin contamination were higher in by products than the individual ingredients.*

Variation impedes rationalization

Variations in nutrient composition of raw materials is the biggest hindrance.

Variation limits the inclusion of many potential raw materials to avoid risk in feed formulation.

Variations increase the use of nutrient overages leading to overall increase in formulation cost.

The cost factor and basis of formulation

For a new raw material sliding into the formula a softer cost of the concerned raw material and an equally harder price of the conventional raw material is needed simultaneously.

Since the gap between these two cost factors are not very wide for cereals the scope of a new cereals is limited unless there is some scarcity.

The scope is wider for proteins as the pricing of main protein source – soybean meal – undergoes frequent fluctuations and availability of alternatives are more

Rationalized purchase decision

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Parameter	Supplier A	Supplier B
Crude protein %	44	48
Price ₹/t	48800	52800
Price ₹ per % protein	1109.00	1100.00
AME kcal/kg	2150	2350
AME obtained kcal/₹ spent	44.06	44.51
Lysine content kg/t	28	31
Lysine digestibility%	80.8	85.4
Dig. lysine kg/t	22.62	26.47
Dig. lysine obtained kg/1000 ₹	463.52	501.33

Despite paying ₹4000/- per ton it is rational to go with supplier B since the nutrient availability for single rupee spent is more with Supplier B.

Parameter	Supplier A	Supplier B
Crude protein %	44	48
Price ₹/t	48800	52800
Price ₹ per % protein	1109.00	1100.00
Coefficient of variation %	2150	2350
Standard deviation	44.06	44.51
CP adjusted to lower SD	28	31
Recalculated price per % CP	80.8	85.4

- Apparently, it will be wiser to go with Supplier B considering the protein content.
- When the variability in the consignments is considered then it will be wiser to be with Supplier A.
- If the feed manufacturer buys 100,000 MT soybean meal per year, then he saves ₹ 400K in a year with this decision.

A sensible feeding program is needed

An imbalance in dietary amino acid with apparently perfect crude protein content made the birds fanatically searching for the deficient amino acids – the condition rectified after the protein imbalance was taken care of.

The final call

1. **Cost-effectiveness: Evaluate beyond purchase price.**
2. **Prioritize flock performance over immediate cost savings.**
3. **Nutrient profile: Consider digestibility, and ANF.**
4. **Risk management: Assess market conditions and ROI.**

Thank You