

# Insights on Ingredient and Nutrient Restrictions

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# Nutritional Specifications

- Nutritional specifications are guidelines. They are defined carefully, reviewed occasionally, and generally quite strictly followed by feed formulators to ensure consistency of nutritional quality of feeds
- Nutrient restrictions are “practical” values taking into account :
  - Requirements of the animal
  - Production objectives
    - Ex: Minimizing cost of formula while obtaining maximum performance
  - Uncertainties
    - Ex: Uncertainties around estimate of nutritional composition, nutritional requirements or potential losses of nutrients requiring use of certain safety margin
- Requires/ hinges on reliable characterization of composition of ingredients
- Interdependence of nutritional specifications is not always well handled by least-cost feed formulation program
  - Important role of nutritionist and feed formulator to review and make rational adjustments

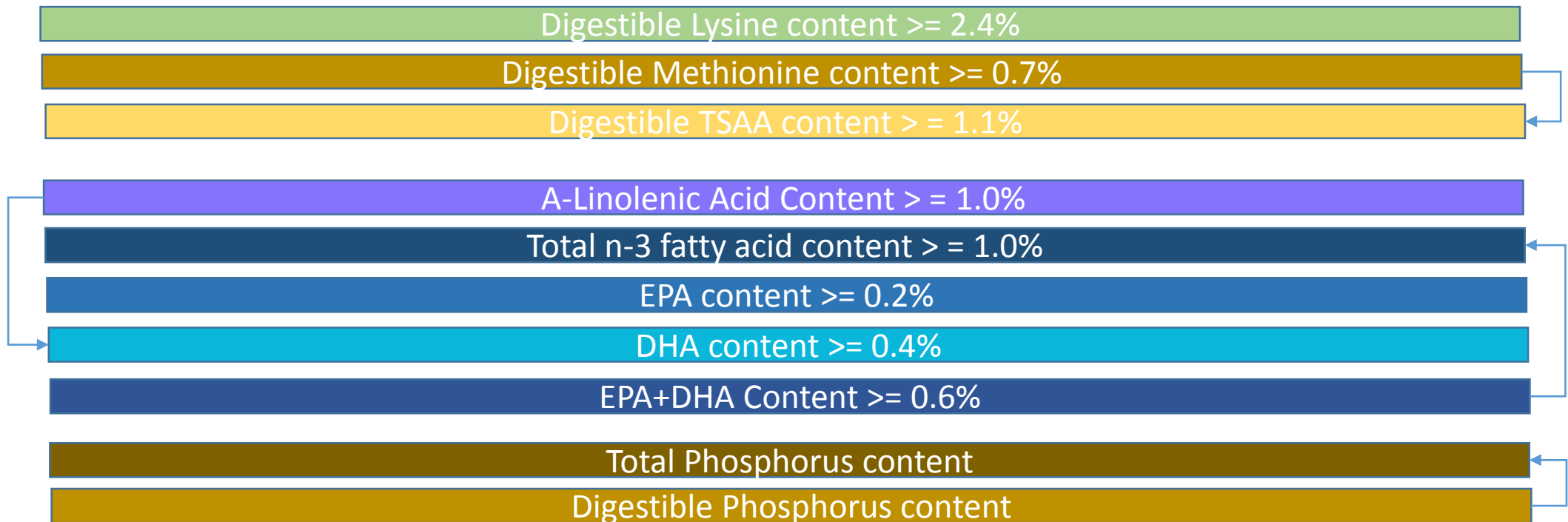
# Least Cost Feed Formulation = Linear Programming

Program solving a series of linear (additive) equations to achieve a certain objective (i.e. minimize cost)

Solving dozens of independent equations until all equations are “true”

No real linkage / feedback loop between equations

Some nutritional specifications are interrelated but the program doesn't know this.



# Ingredient Restrictions

- Generally driven by practical considerations and “gaps” in knowledge
- Considerations:
  - Effect on processing (handling limitations, effect on pellet quality, etc.)
  - Chemical and/or nutritional characteristics not easily or not adequately addressed through the current nutritional specifications
  - Logistical, risk management and market issues (limited availability, contamination, variability, final product characteristics, customer concerns, export regulations, etc.)
- In general, the more we characterize the animals and the ingredients, the less important the ingredient specifications. However, some logistical considerations still always play a role