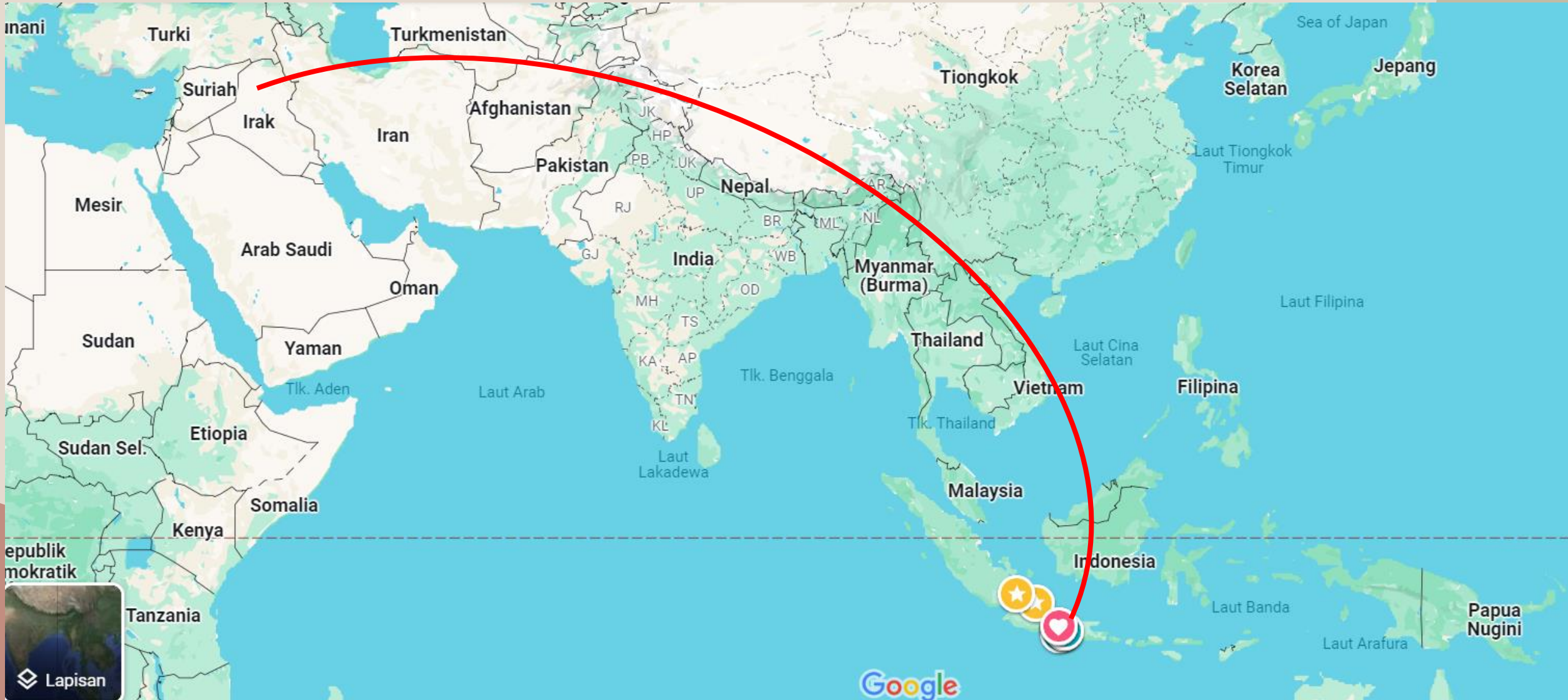


Modern Trend In Poultry Nutrition

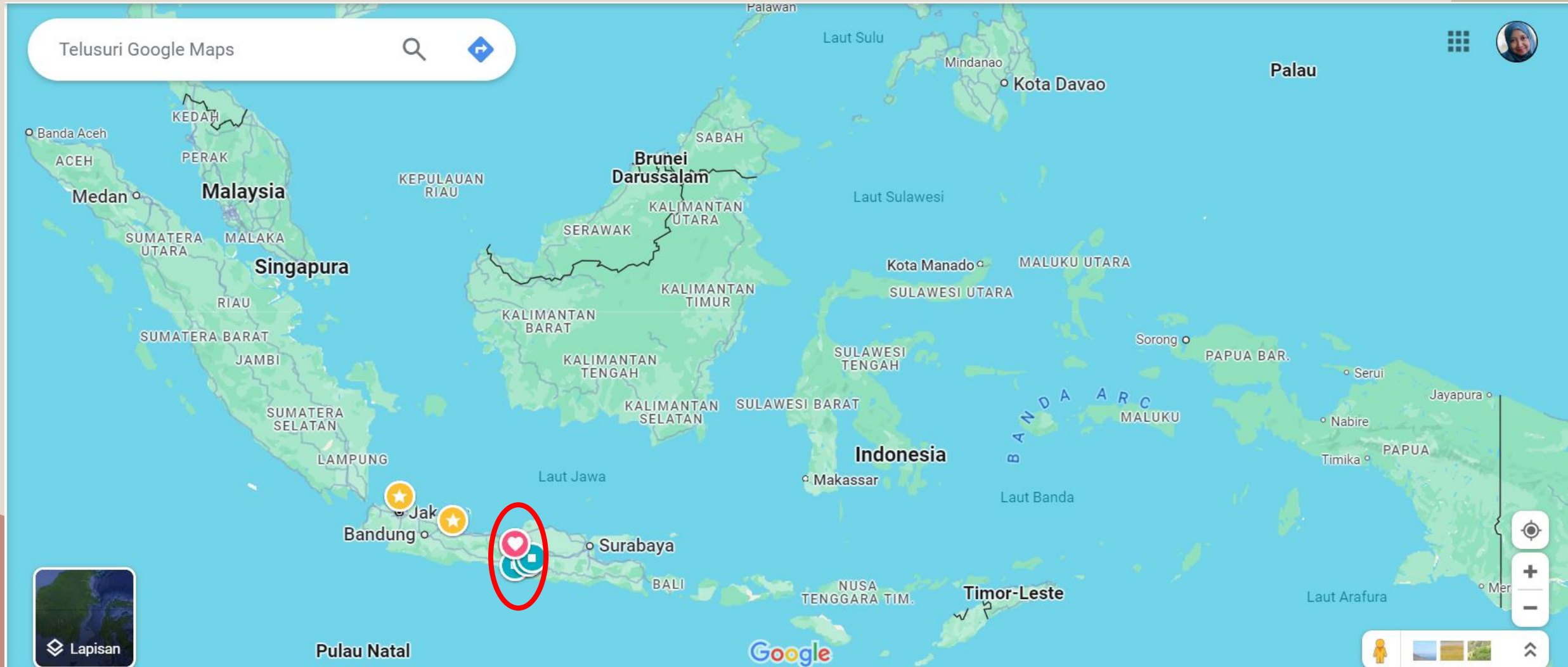


Fatimah S.Pt., M.Si
Founder PT. Avidha Global Innova
Faculty Animal and Agriculture Science
Diponegoro University - Indonesia

Geography



Diponegoro University, Semarang Indonesia



Profile

Fatimah S.Pt., M.Si



Personal details

 Fatimah S.Pt., M.Si

 fatimahavicenna@gmail.com

 +628118111340

Current Activity

Run my own business

1. Consultant of Poultry and livestock nutrition.
2. Develop, manage and selling my own Product (Rovimin Golden Egg, BIOCORN, Basemix12 for layer hen) with the team.
3. Manage project with local government to educate & empowering farmers.
4. Providing Additives and ingredients needed by farmers by collaborating with local distributors, feed & feed additives company (Starfeed, Nufeed, CJ, Trouw, Biochem, United Chemical etc)
5. Set up team & system to achieve business target

Employment

Technology Application Manager (nutritionist) and Aiden Business Development Cargill Animal Nutrition, Jakarta (National role)	Jan 2012 - Jun 2023
Feed mill supervisor (Management trainee program) Greenfield Indonesia Dairy Farm, Malang, East Java	Nov 2010 - Dec 2011
Broiler Breeding farm supervisor & Hatchery data Analyst Cibadak Indah Sari Farm, Tangerang	Mar 2010 - Sep 2010

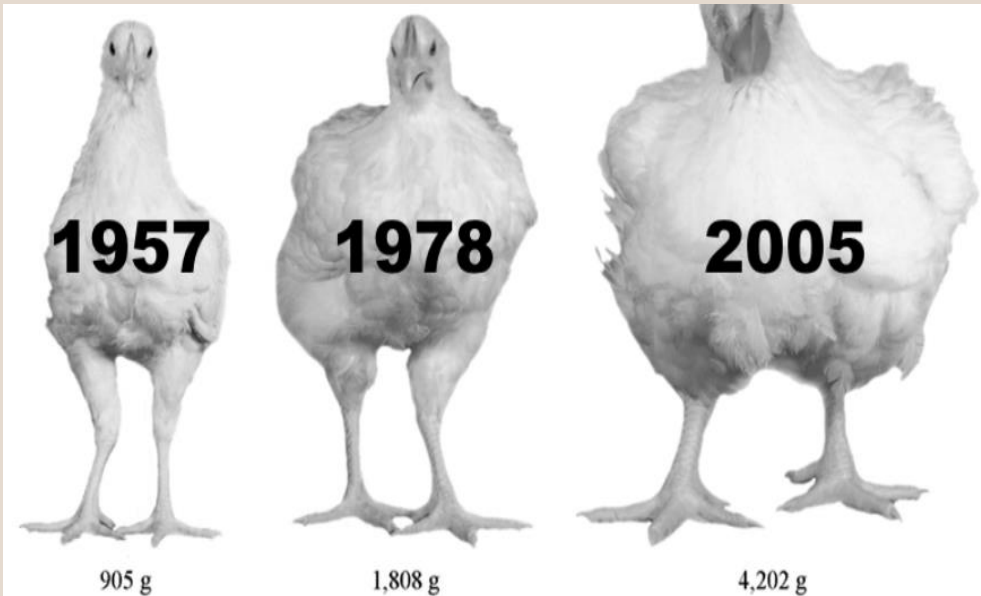
Global Trend of Poultry Nutrition Industry

- Precision nutrition
- Alternatives Protein source
- Reduction of the use of Antibiotics & AGP
- Sustainable feed ingredient

Precision Nutrtn

Why ?

Broiler performance progress



- Chicken Today are 4 times heavier than in 1957
- **Chickens today are more efficient at turning feed into meat**
- **Modern chickens also have extra health problems**

Previous research has noted increased bone, heart, and immune system problems in some contemporary chicken breeds. Health problems could come from several factors, including both unintentional genetic effects and behavioral differences such as diet and carrying around all that extra weight.

Precise Nutrition is essential to support birds performance

Layer Performance

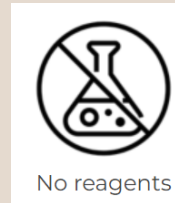
		1970	2000	2008	2017	2020
HH EGGS AT 75 Weeks	(NRS)	239	319	327	350	361
HH EGGS AT 90 Weeks	(NRS)				429	446
HH EGGS AT 100 Weeks	(NRS)					500
AGE AT 50% PRODUCTION	(WKS)	26	20	20	20	20
AGE AT PEAK PRODUCTION	(WKS)	29	26	26	25	25
RATE OF LAY AT PEAK	(%)	86	95	96	97	97
EGG MASS AT 75 Weeks	(KG)	14.9	20.0	20.8	21.9	22.6
EGG MASS AT 90 Weeks	(KG)				27.0	28.0
EGG MASS AT 100 Weeks	(KG)					31.5
FEED/DAY	(G/D)	127	114	114	113	112
FCR resp. 75 to 90 to 100 weeks of age	(KG/KG)	3.46	2.31	2.23	2.14	2.07
LIVEABILITY	(%)	90	94	94	95	95
HEN DAY RATE OF LAY AT 75 Weeks	(%)	55	74	76	80	82
BODYWEIGHT AT 18 Weeks	(KGS)	1.72	1.55	1.55	1.50	1.50
ADULT BODYWEIGHT	(KGS)	2.5	2.0	2.0	2.0	1.9

Precise Nutrition is essential to support hen performance



Precision Nutrition

- Advance Data collection & analysis to customize formula
- Detail Feed Specification for different growth stage





Sertifikat Produk

Informasi Sample

Nama Sample: Sampel Dedak Bu Fatimah
 ID Nutreco: 3366254
 Material: 15200-Rice bran extracted
 Tanggal Analisa: 21/02/2024 06:48:00 UTC
 Pelanggan: PT Nufeed International Indonesia
 Deskripsi: Sampel Dedak Bu Fatimah | NOA Raw
 Material | - | qa@nufeed.co.id

Tanggal 21/02/2024 07:25:10 UTC

Origin:
 Suplier:
 Nama Produk:
 Informasi Tambahan:
 Tanggal Sampling:

Kadar nutrisi (proximate)			
Moisture	107	g/kg	60 145
Dry Matter	893	g/kg	855 940
Crude Ash	82	g/kg	60 190
Crude Protein	102	g/kg	16 216
Lemak Kasar (ee)	92	g/kg	Tinggi 85
Lemak Kasar (ha)	99	g/kg	
Crude Fiber	128	g/kg	55 385
Starch	326	g/kg	40 400
Starch (amylglucosidase)	303	g/kg	
Sugar	23	g/kg	
NFE	489	g/kg	
NDF	281	g/kg	
ADF	130	g/kg	
ADL	21	g/kg	
NSP	285	g/kg	

Asam Amino					
LYS	4.3	g/kg	LEU	7.4	g/kg
MET	2.1	g/kg	TYR	3.5	g/kg
CYS	2.2	g/kg	VAL	5.6	g/kg
MET+CYS	4.4	g/kg	ALA	6.0	g/kg
THR	3.8	g/kg	ASP	9.1	g/kg
TRP	1.1	g/kg	GLU	14.8	g/kg
ILE	3.8	g/kg	GLY	5.2	g/kg
ARG	7.9	g/kg	PRO	4.6	g/kg
PHE	4.8	g/kg	SER	4.8	g/kg
HIS	2.7	g/kg	AA total	93.7	g/kg

Asam Lemak			
------------	--	--	--

C16:0	10.2	g/kg
C16:1	0.2	g/kg
C18:0	1.2	g/kg
C18:1	24.0	g/kg
C18:2	22.2	g/kg

Poultry		
MEpoultry (MJ)	10.29	MJ/kg
MEpoultry (kCal)	2459	kcal/kg
MELayer (MJ)	10.60	MJ/kg
MELayer (kCal)	2533	kcal/kg

Poultry Amino Acids SID		
SID LYS po	2.7	g/kg
SID MET po	1.6	g/kg
SID CYS po	1.2	g/kg
SID M+C po	2.7	g/kg
SID THR po	2.3	g/kg
SID TRP po	0.8	g/kg
SID ILE po	2.5	g/kg
SID ARG po	6.1	g/kg
SID PHE po	3.2	g/kg
SID HIS po	1.8	g/kg

Poultry Amino Acids AFD		
dLYS poultry	2.9	g/kg
dMET poultry	1.5	g/kg
dCYS poultry	1.4	g/kg

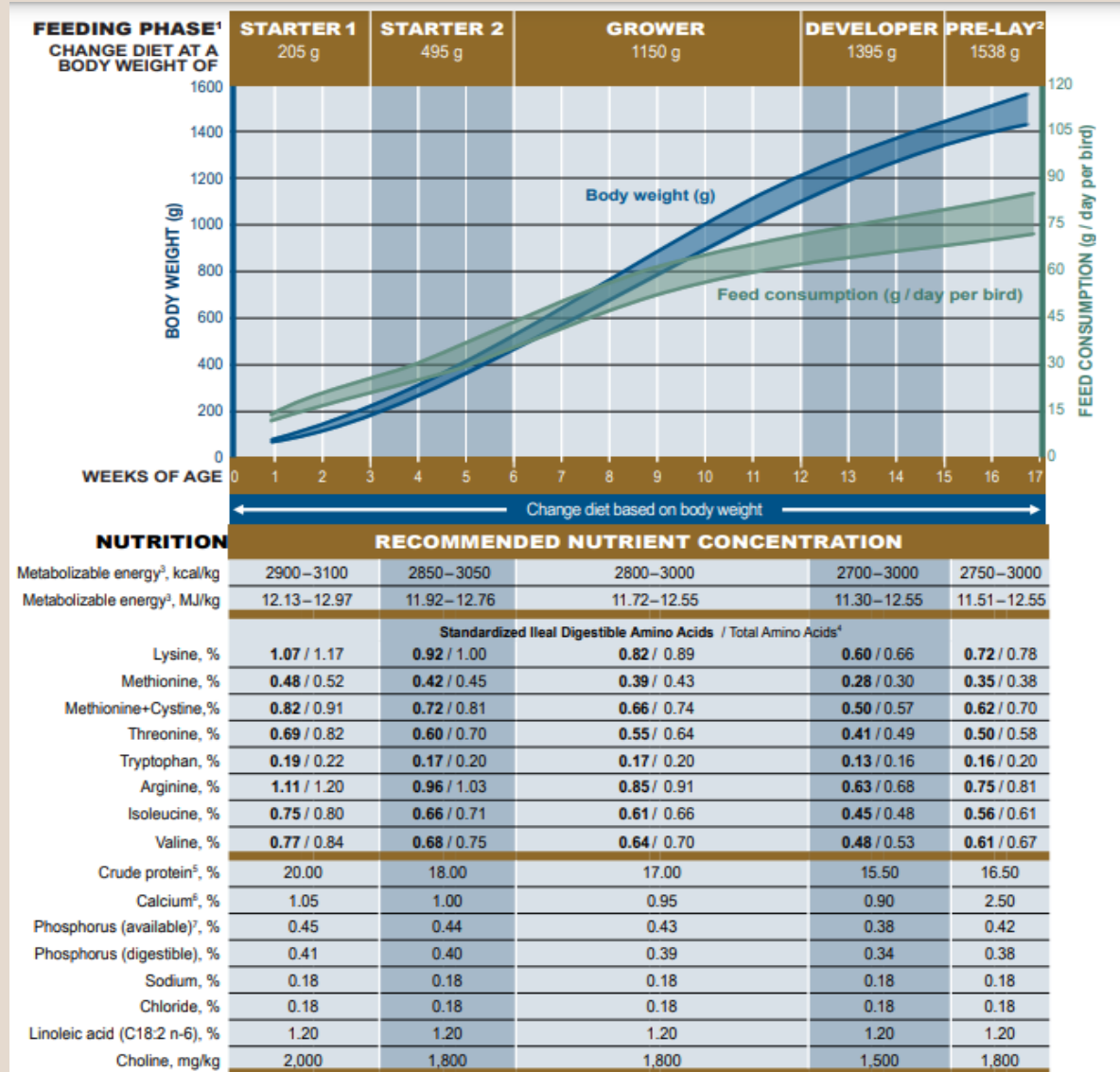
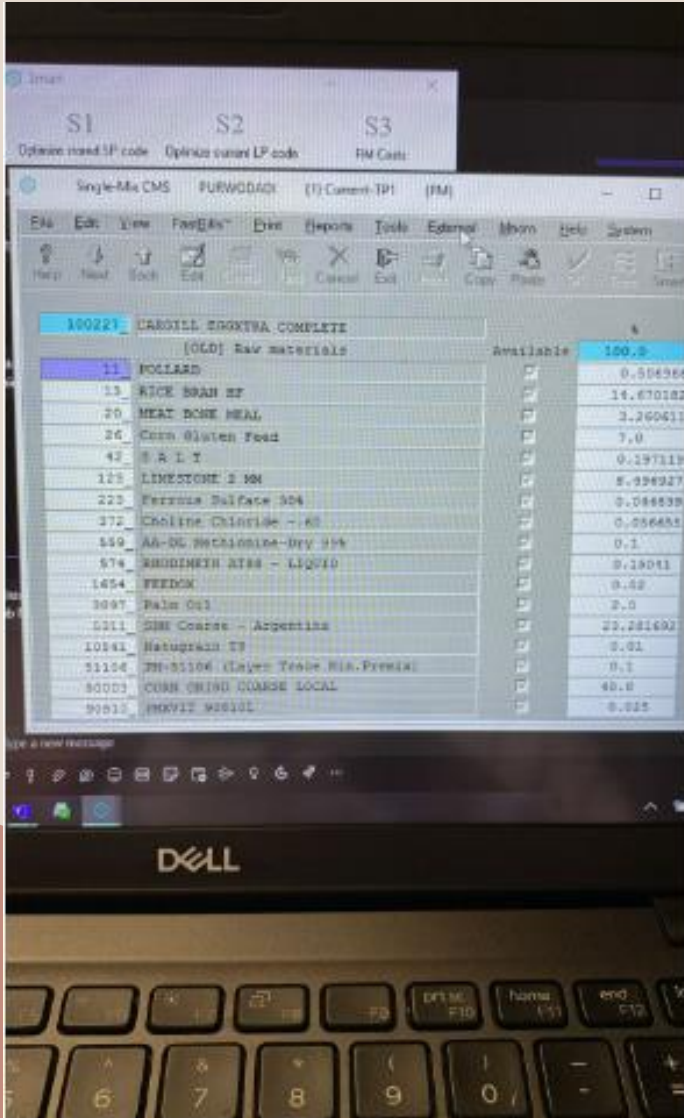
C18:3	0.6	g/kg
Omega 3	0.6	g/kg
Omega 6	22.2	g/kg
EFA	23	g/kg
RUFAL	46.9	g/kg

MEbroiler (MJ)	8.14	MJ/kg
MEbroiler (kCal)	1946	kcal/kg
MEbroiler2019(MJ)	8.15	MJ/kg
MEbroiler2019(kCal)	1948	kcal/kg

SID LEU po	5.0	g/kg
SID TYR po	2.4	g/kg
SID VAL po	3.8	g/kg
SID ALA po	4.1	g/kg
SID ASP po	5.7	g/kg
SID GLU po	10.7	g/kg
SID GLY po	3.1	g/kg
SID PRO po	2.7	g/kg
SID SER po	3.2	g/kg

dLEU poultry	5.1	g/kg
dTYR poultry	2.5	g/kg
dVAL poultry	3.8	g/kg

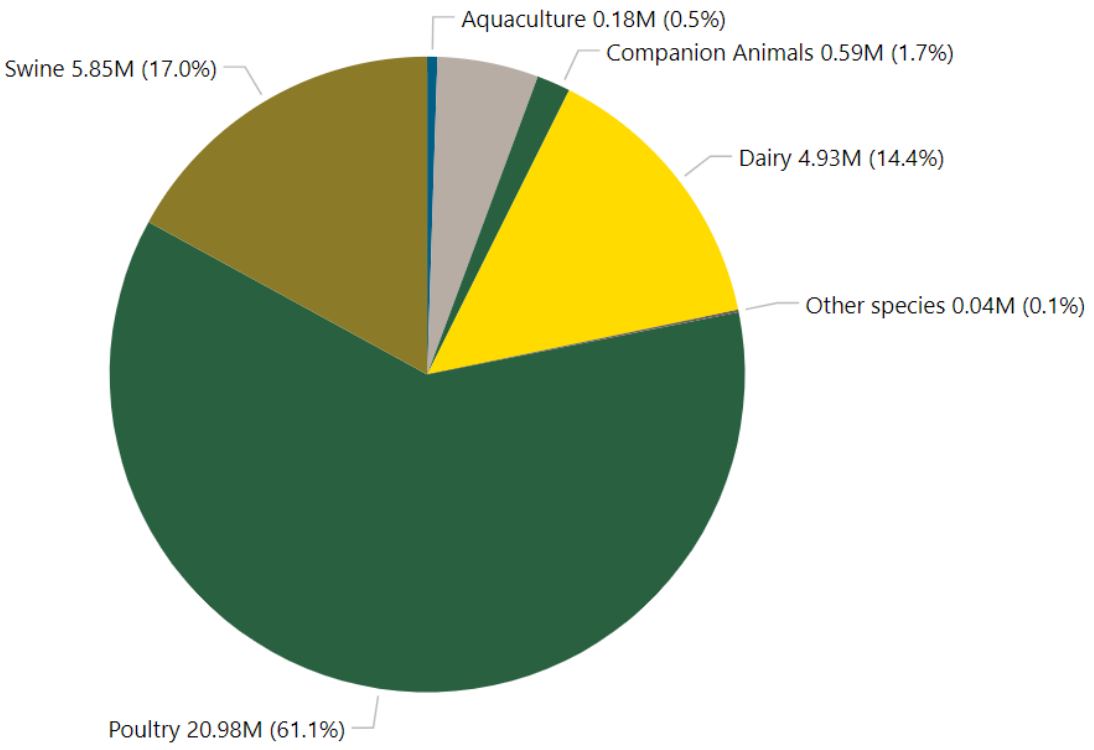
Detail feed specification for different growth stage



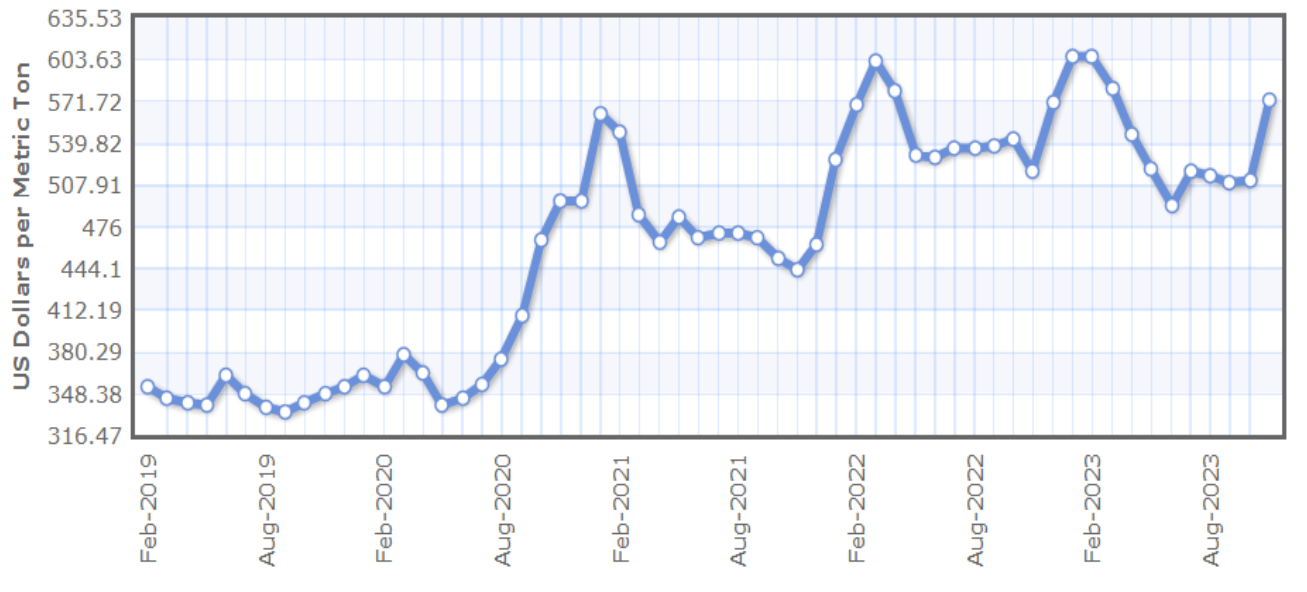
Alternatives Protein Source

World are very depend on Soy bean meal and fish meal as protein source for animal feed (especially for poultry)

U.S. Soybean Meal Feed Use by Species (MT)



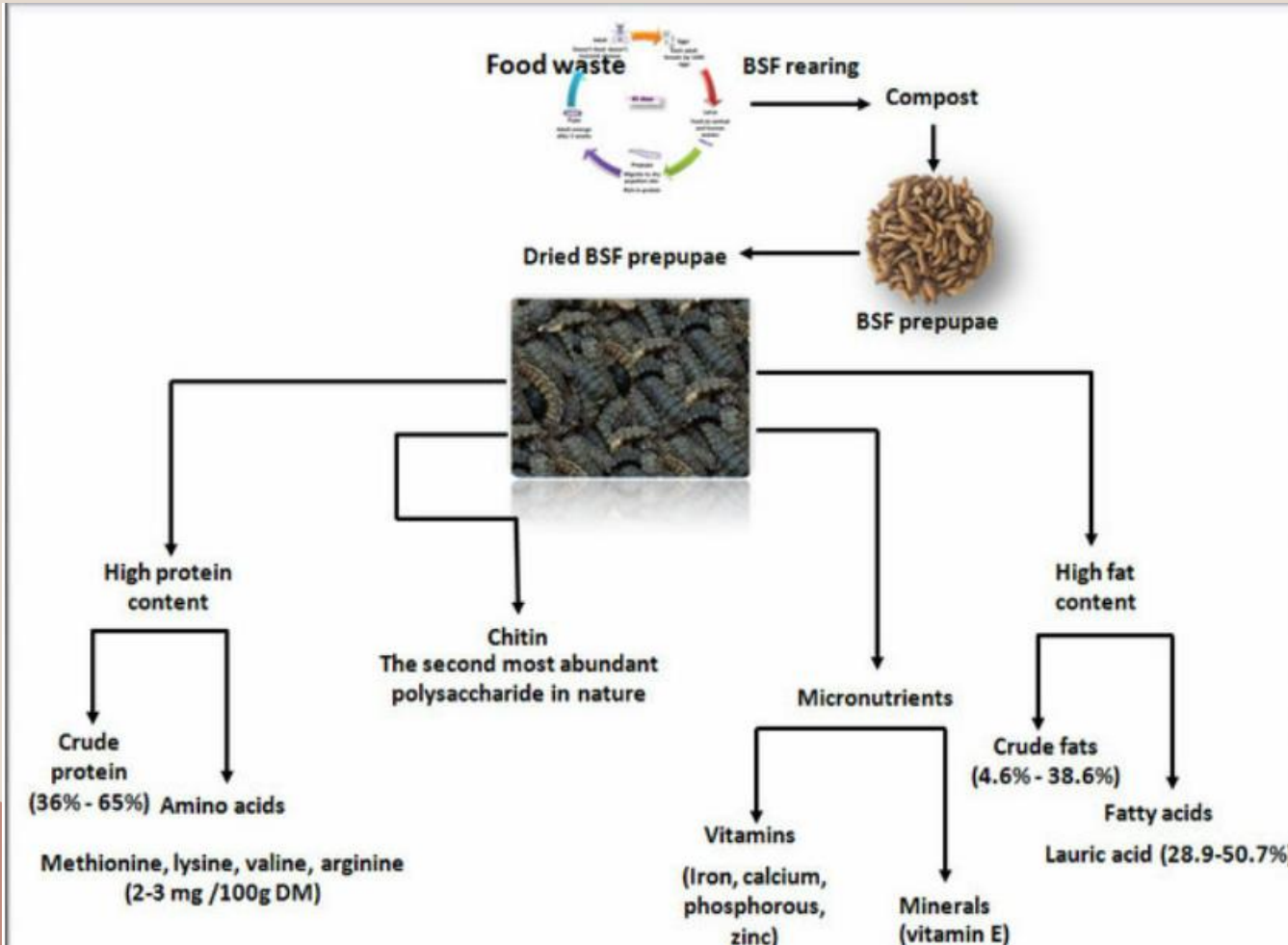
Sources: USB Soybean Meal Demand Assessment Reports (Note that estimates include the consumption of soybean hulls.) and USDA/WASDE; Date last updated 1/12/2023



Source : CBOT –CME Group, 2023)

To reduce dependence on soybean meal, there is a growing interest in alternatives protein sources like insect meal, algae, and single-cell proteins, which are sustainable and nutrient-dense.

Alternatives Protein Source

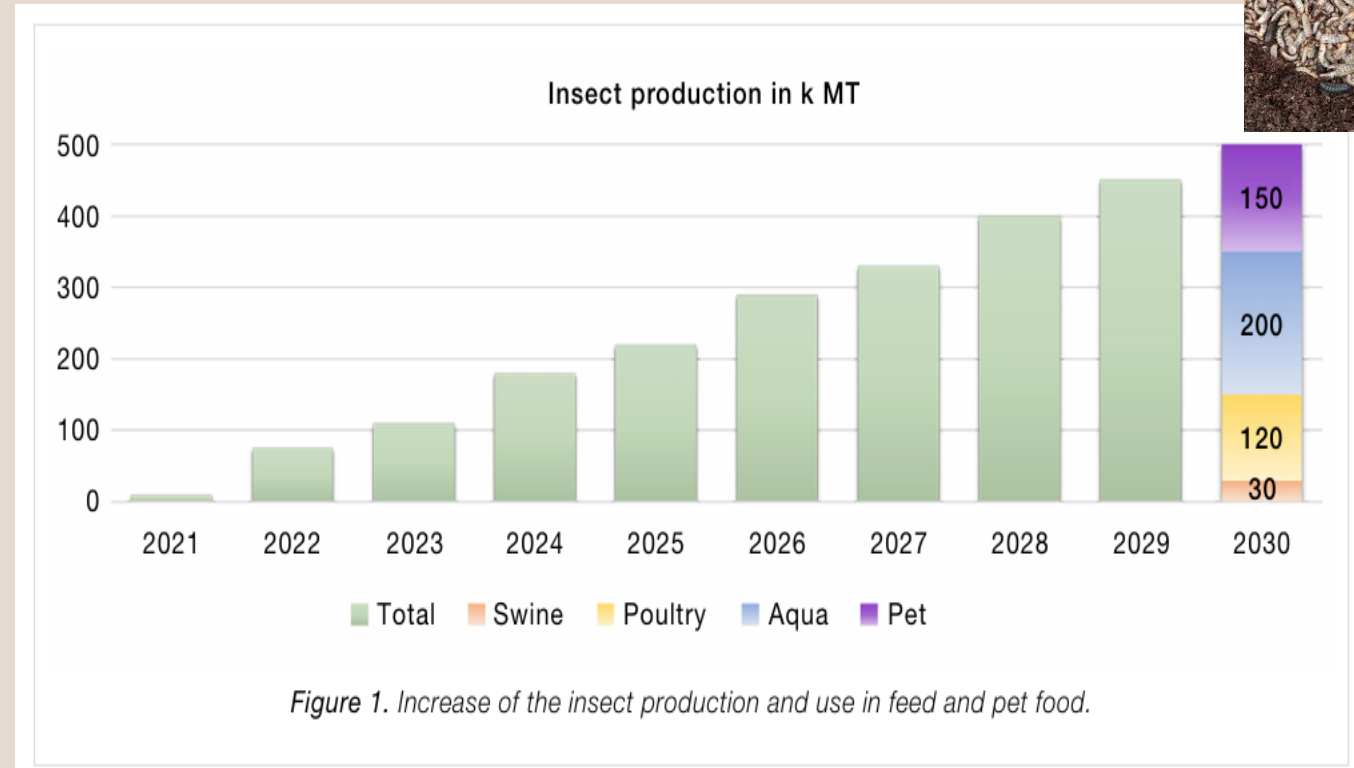


References	CP %	CF %	Ash %	Amino Acids % DM					
				LYS	MET	THR	ARG	VAL	ILE
Spranghers et al. [13]	39.9-43.1	21.8-38.6	2.7-19.7	2.34-2.57	0.71-0.87	1.54-1.68	1.99-2.03	2.41-2.82	1.72-1.91
St-Hilaire et al. [18]	43.6	33.1	15.5	2.62	0.74	1.78	2.65	2.79	2.03
Barroso et al. [39]	36.2	18	9.3	2.75	0.54	1.95	2.98	2.28	2.1
Barroso et al. [39]	40.7	15.6	19.7	2.9	1.3	2	3.27	2.6	2.17
De Marco et al. [11]	36.9	34.3	17.3	2.23	0.9	1.52	1.94	2.2	1.72
De Marco et al. [11]	55.3	18	9.9	2.1	0.65	1.7	2.2	2.7	1.9
Cullere et al. [41]	54.8	15.6	7.7	2.1	0.66	2.04	1.73	3.8	2.34
De Marco et al. [11]	65.5	4.6	9.3	2.5	0.86	2.2	2.7	3.5	2.4
Marono et al. [42]	62.7	4.7	8	4.14	1.33	2.37	-	5.13	3.18
Mwaniki et al. [43]	57.5	7	-	3.3	0.92	2.32	2.79	3.47	2.44

Item	Ingredients			
	Casein	SBM	Fishmeal	BSFLM
Dry matter	90.7	89.8	92.4	95.8
Crude protein	88.0	47.4	56.0	54.9
Crude fat	0.12	1.72	8.60	13.3
Starch	0.05	1.05	0.74	7.79
Calcium	0.01	0.20	7.38	1.01
Phosphorous	0.24	0.64	3.97	0.87
Sodium	0.07	0.05	0.70	0.17
Potassium	0.04	2.23	0.66	1.35
Magnesium	0.00	0.28	0.19	0.37

(Veronica et al., 2023)

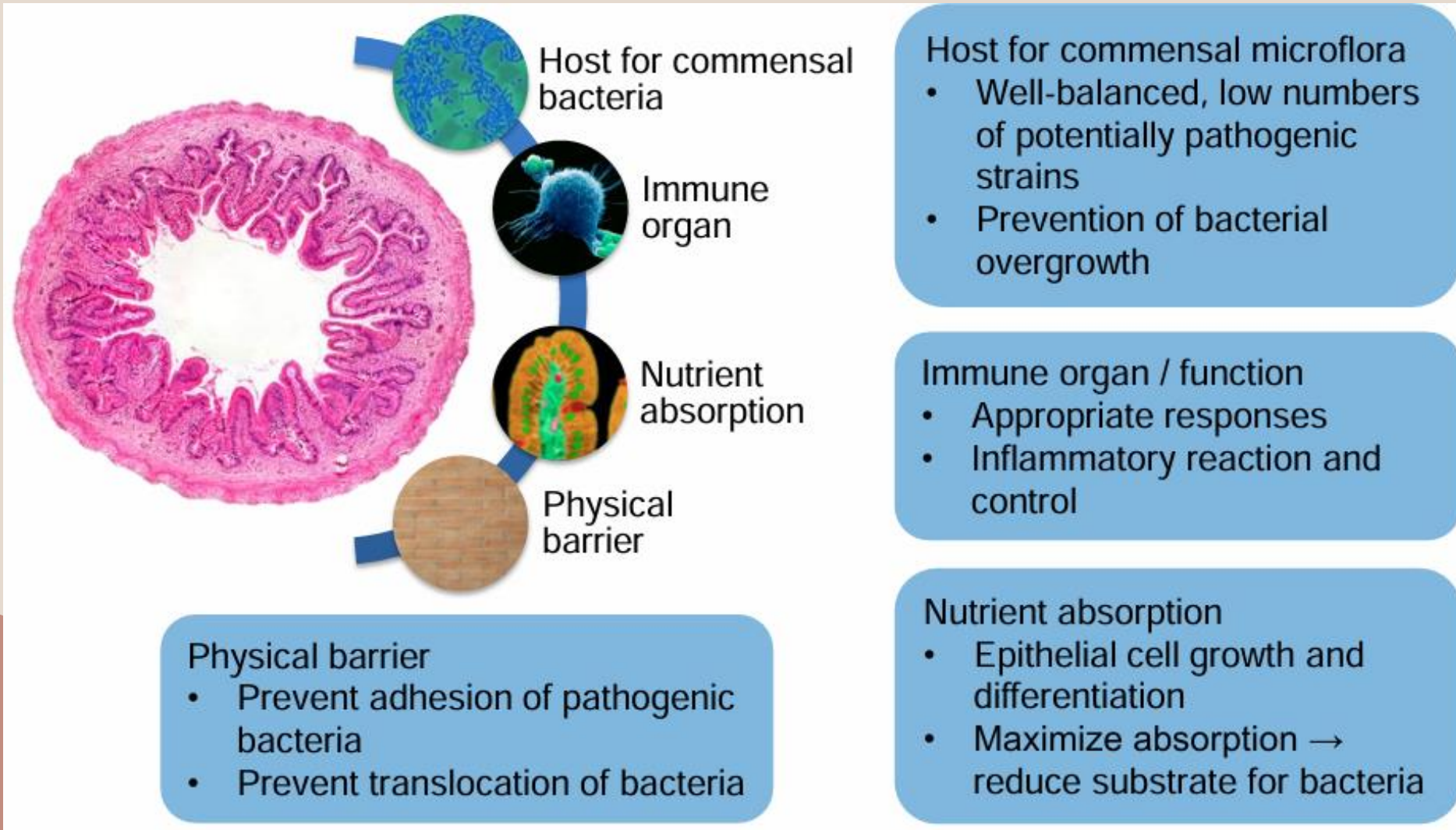
Alternative Protein Source



- Insect production predicted will be increase consistently since most of research showing good result
- Funding and investment on BSF is very massive since concept of its production is very relevant with Sustainability and circulars economy issues

Reduction of the use of Antibiotics & AGP

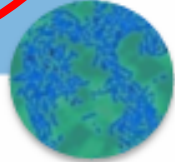
- Key function of the gut



Reduce the use of AGP by Improving gut health

1 Manage microflora

- Well-balanced, low numbers of potentially pathogenic strains
- Prevention of bacterial overgrowth



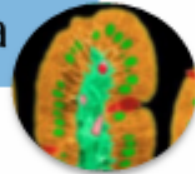
2 Control immune function

- Appropriate responses
- Inflammatory reaction and control



3 Maximize nutrient absorption

- Improve epithelial cell growth and differentiation
- Maximize nutrient digestion → reduce substrate for bacteria



4 Improve physical barrier

- Prevent adhesion of pathogenic bacteria
- Prevent translocation of bacteria

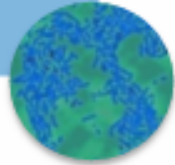


How to manage gut Microflora

- prebiotic, like lactose (minimum 0.25 %), in pre-starter and starter feeds
- Use essential oils (preferably with thymol, cinnamaldehyde, oregano oil / carvacrol)
- Combine essential oils with low levels of organic acids (citric acid, butyrate) or potentially medium chain fatty acids (at least 0.5 % of MCFA, preferably 1.0 % in (pre)starters).
- A position has to be taken on the use of direct fed microbials (probiotics)
- Reduce substrate for bacteria (see for this the maximizing nutrient absorption recommendations)

Improve gut health

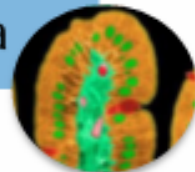
- 1 Manage microflora
 - Well-balanced, low numbers of potentially pathogenic strains
 - Prevention of bacterial overgrowth



- 2 Control immune function
 - Appropriate responses
 - Inflammatory reaction and control



- 3 Maximize nutrient absorption
 - Improve epithelial cell growth and differentiation
 - Maximize nutrient digestion → reduce substrate for bacteria

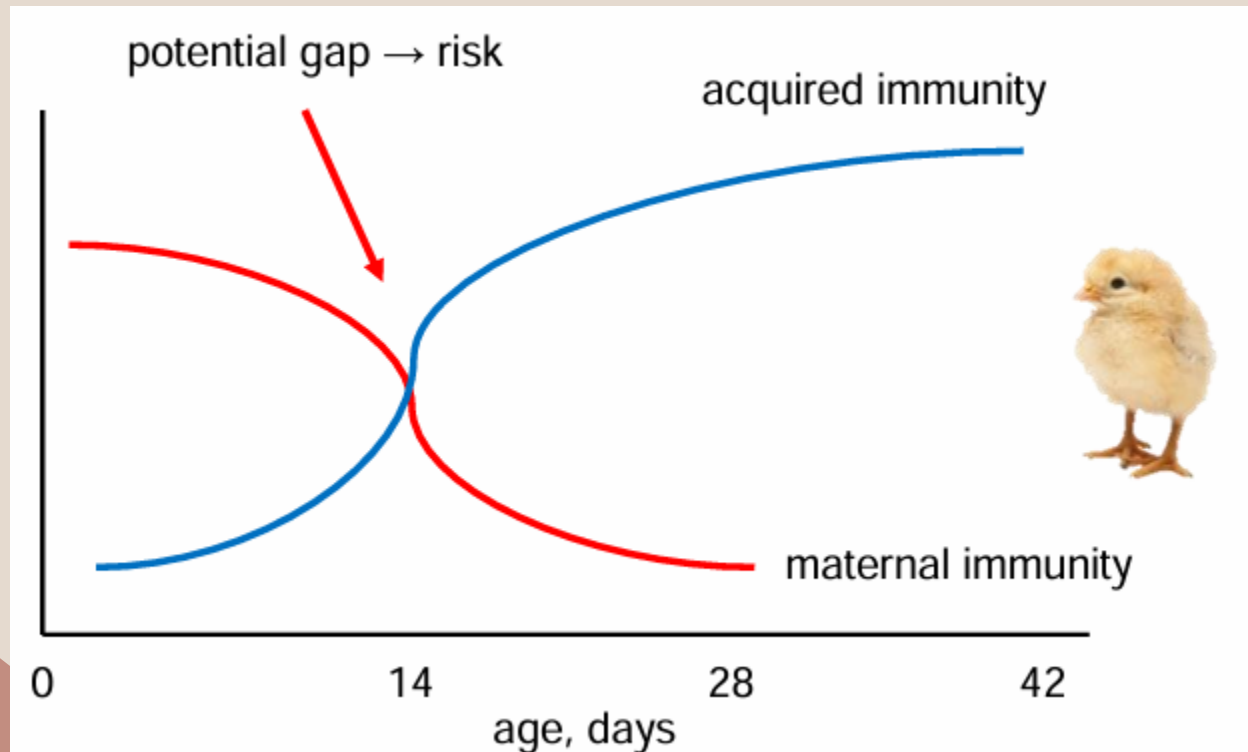


- 4 Improve physical barrier
 - Prevent adhesion of pathogenic bacteria
 - Prevent translocation of bacteria

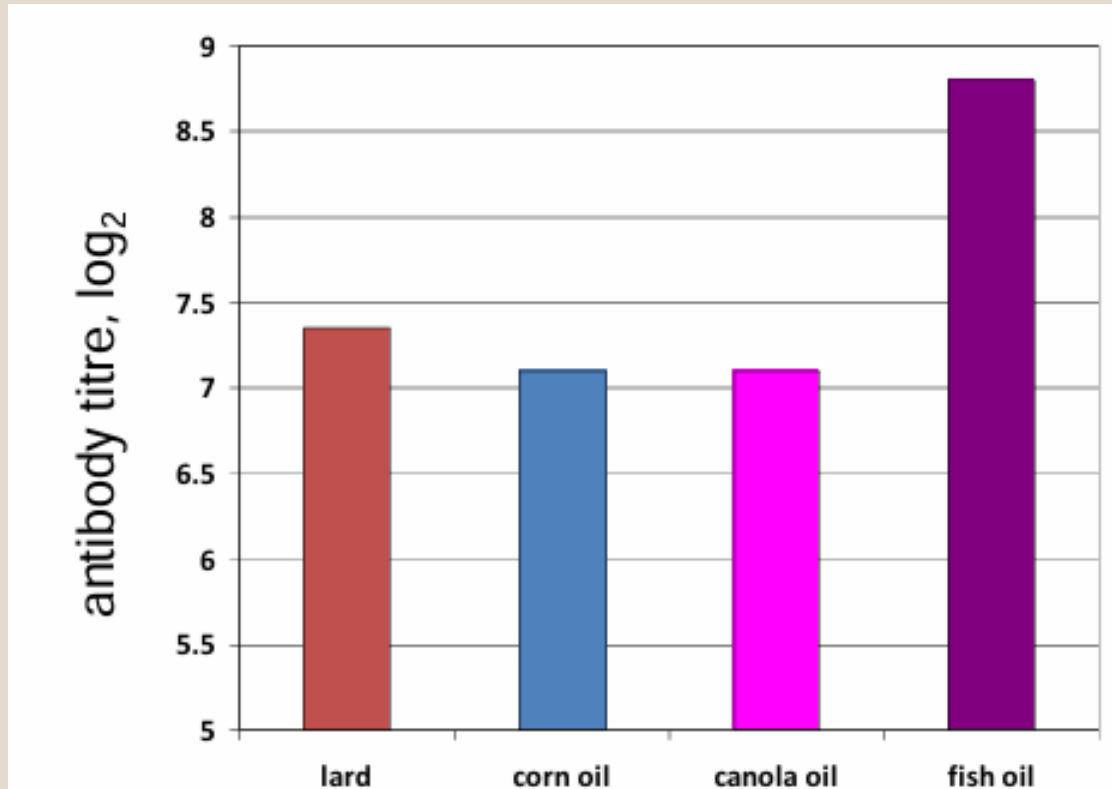


Improve immune function

The gap in immune status when changing from maternal to acquired immunity becomes more critical in antibiotic free production; therefore it becomes more important to improve both maternal and chicken immune status



Control Immune Response



- Fish oil and linseed oil are good source of ω -3 fatty acid.
- 0,5% of fish oil or 1% of linseed oil added to broiler prestarter diet to control immune response

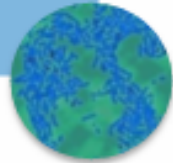
ω -3 and ω -6 fatty acids can influence the type and rate of eicosanoid production in leukocytes and hence immune responses

Fritzsche et al., 1997

Improve gut health

1 Manage microflora

- Well-balanced, low numbers of potentially pathogenic strains
- Prevention of bacterial overgrowth



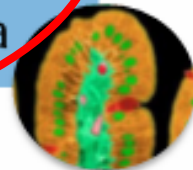
2 Control immune function

- Appropriate responses
- Inflammatory reaction and control



3 Maximize nutrient absorption

- Improve epithelial cell growth and differentiation
- Maximize nutrient digestion → reduce substrate for bacteria



4 Improve physical barrier

- Prevent adhesion of pathogenic bacteria
- Prevent translocation of bacteria



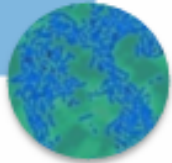
Maximize nutrient absorption

- Use coarse fiber / particles in order to increase protein and starch digestibility, to increase retention in the gizzard (better acidification) and to increase digesta transit time in the small intestinal tract (reduced risk of bacterial overgrowth in the upper part of the intestinal tract).
- Formulate feeds at as low crude protein levels as possible → reduction of the amount of indigestible / fermentable crude protein
- Use NSP degrading enzymes, especially in young chickens
- Apply low dietary Ca levels and superdosing of phytase in order to maximize phytate degradation so that protein digestibility can be improved

Improve gut health

1 Manage microflora

- Well-balanced, low numbers of potentially pathogenic strains
- Prevention of bacterial overgrowth



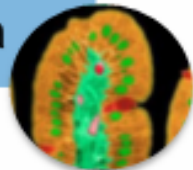
2 Control immune function

- Appropriate responses
- Inflammatory reaction and control



3 Maximize nutrient absorption

- Improve epithelial cell growth and differentiation
- Maximize nutrient digestion → reduce substrate for bacteria



4 Improve physical barrier

- Prevent adhesion of pathogenic bacteria
- Prevent translocation of bacteria



Improve physical barrier

- Apply a number of components with anti-inflammatory properties or that change microflora and also can improve tight junction function, especially during heat stress
- Anti-inflammatory: ω -3 fatty acids rich ingredients, like fish oil and linseed oil, zinc, polyphenols and vitamin E and C
- Adding butyrate (250-300 mg/kg) as organic acid to manage pH
- Mannose containing raw materials, like palm kernel meal, and manno oligosaccharide rich products, like Agrimos, can specifically bind Salmonella and can be part of a program to reduce Salmonella incidence

Sustainable Feed Ingredients



Better awareness of Environmental sustainability and reduce waste

- Increasing use of Agricultural by-products
(palm kernel meal, copra meal, canola meal, sun flower meal, rice bran, wheat pollard)
- Alternatives grain (millet, sorghum, barley)
- Fermented feed ingredients (DDGD)

Agriculture by product

Copra Meal



- Is the dried meat or kernel of coconut (*Cocos nucifera* L.) that remains after oil extraction
- Medium energy ingredient that varies widely in terms of fat, fiber, and protein composition.
- Should be limited in poultry diets due to its high fiber content (present as mannans, galactomannans, and cellulose) and also potentially high level of aflatoxins.
- 5 – 7% inclusion level for layer and broiler

ADVANTAGES

- Good digestible fat although the fat level is low
- Good fiber source

DISADVANTAGES

- Risk of Aflatoxins
- Fat quality may vary

Alternatives grain

Shorgum /Milo

- Common energy source ingredient for poultry.
- Must have low tannin levels -- high tannin levels reduce amino acid digestibility

ADVANTAGES

High energy

Linoleic acid content

Ideal speed of digestion in combination with wheat and barley

Price attractive

Optional replacer of (white) corn

DISADVANTAGES

Contains tannines which should be maximized (max 0.6-1.0%)

Small seed which should be ground finely Back

When replacing corn: it does not contain Xanthophyll's while corn does (colour pigments)



Fermented feed ingredient Distillers Dried Grains and Solubles (DDGS)

Obtained after the removal of ethyl alcohol by distillation from the yeast fermentation of a grain or a grain mixture.

Has high variations in nutrient availability and appearance due to processing conditions

Young birds should be fed lower levels than adult birds.



ADVANTAGES

- High protein content
- Attractive pricing

DISADVANTAGES

- High fiber content and thus lower energy
- Due the concentration of mycotoxins from corn, it is important to monitor.



شكرًا لك

Terimakasih

Thank you