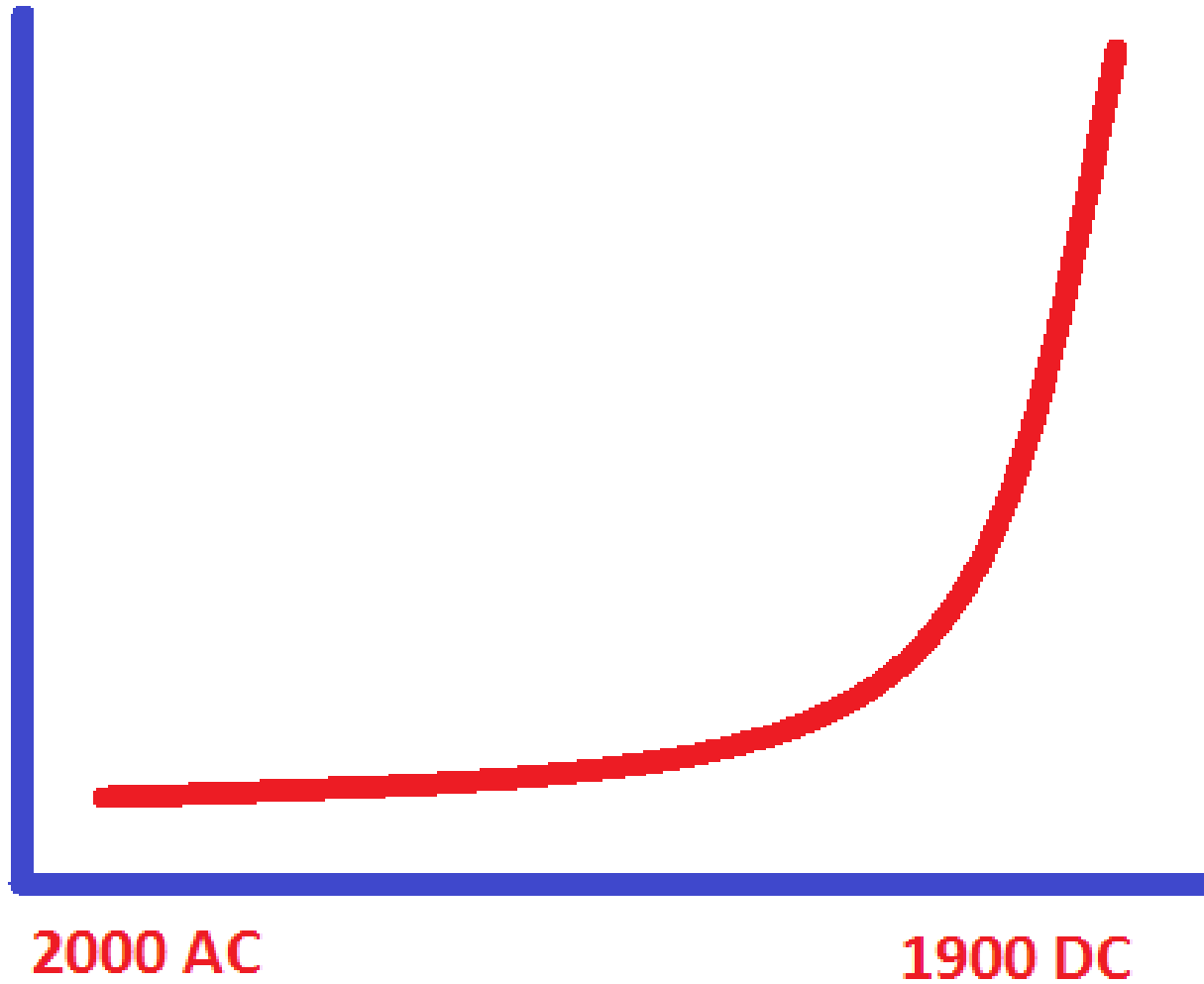


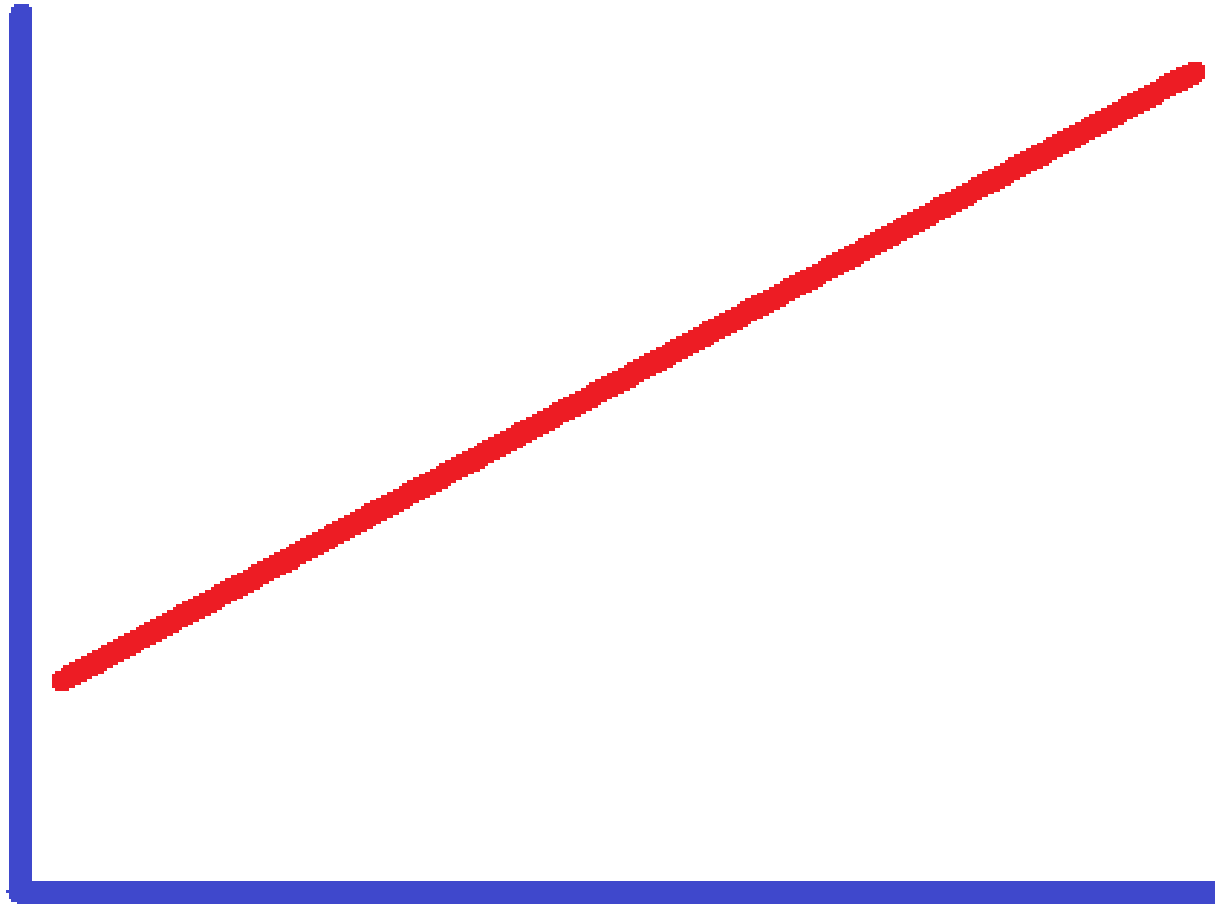
El rol especializado de la harina y aceite de pescado en la acuicultura



Población Mundial



Producción Alimento Acuícola



Producción Alimento Acuícola

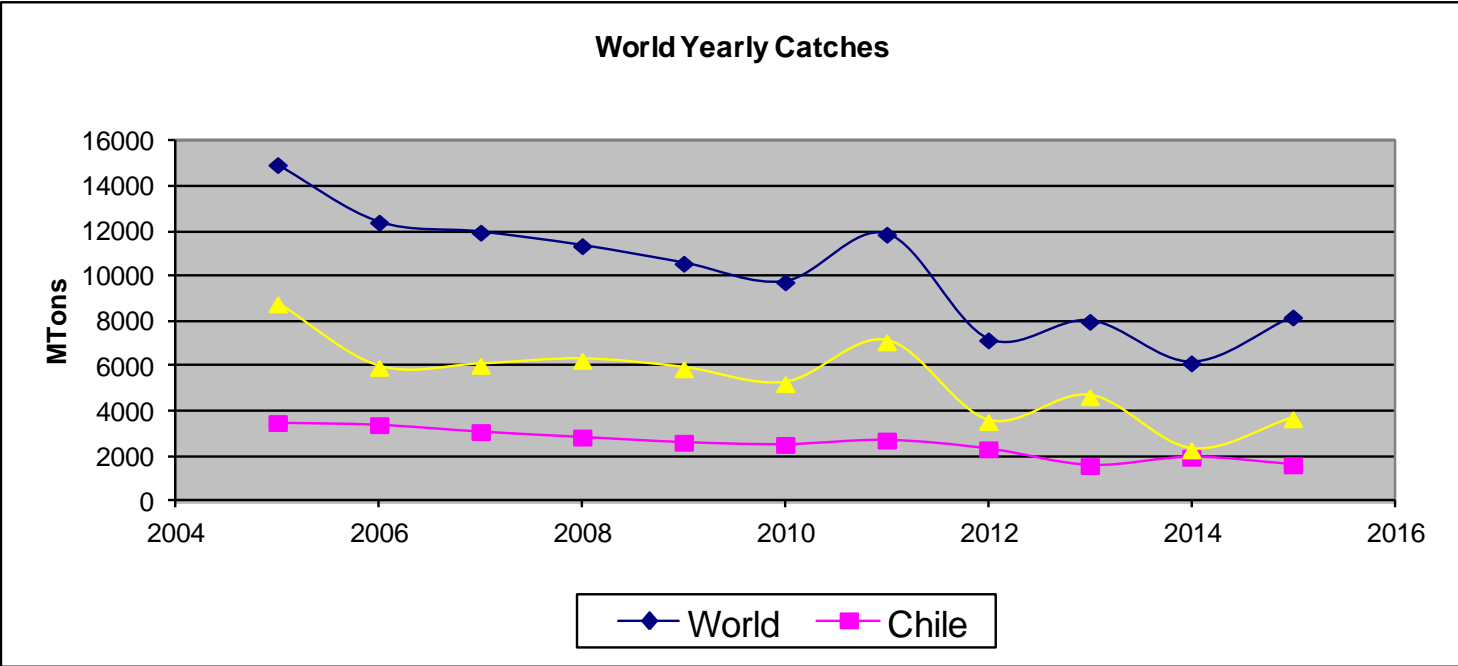


Producción Harina de Pescado

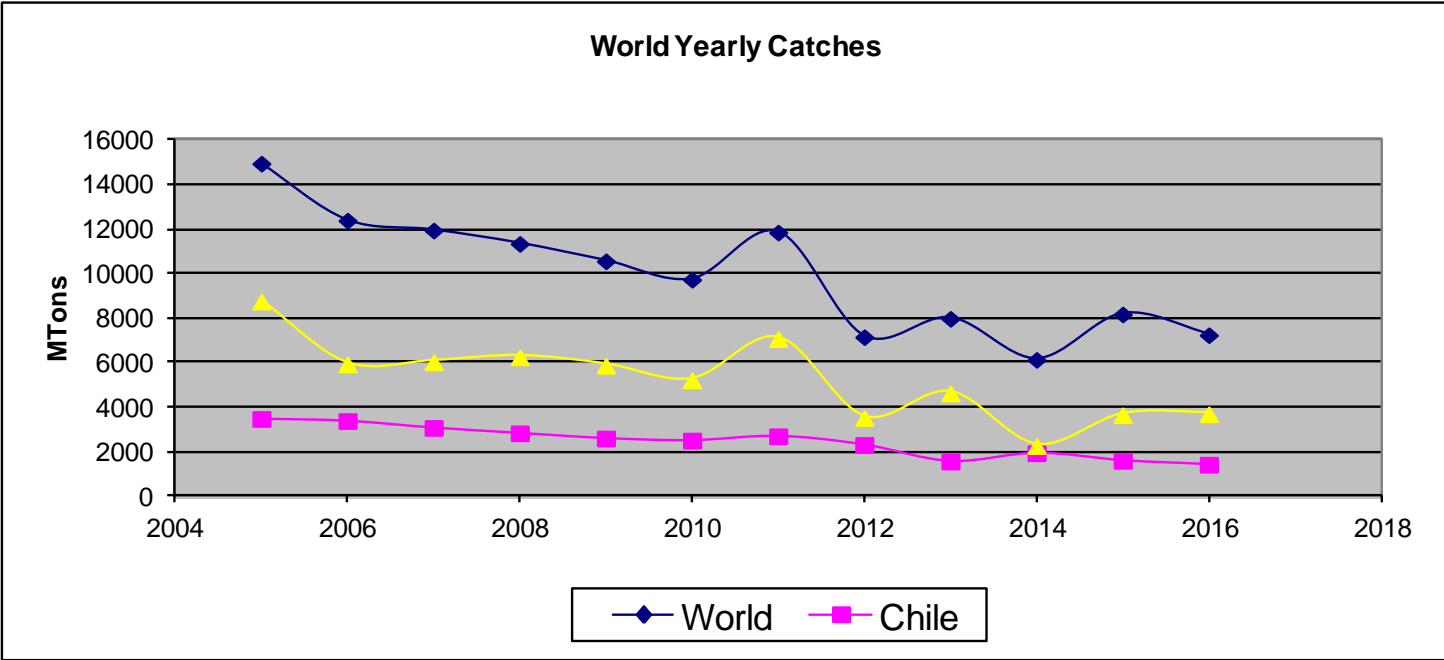
World Yearly Catches (in thousand MT)

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Chile	3510	3416	3108	2864	2632	2538	2731	2341	1596	1967	1629	985
Peru	8784	5961	6053	6277	5900	5241	7098	3551	4656	2293	3674	1319
Norway/Denmark	1046	998	811	1236	1201	1147	1344	537	803	1095	1706	941
Iceland/N.Atlantic	917	677	723	999	862	840	712	758	955	809	1195	717
Total	14981	12422	11976	11376	10594	9765	11885	7186	8010	6163	8205	3961

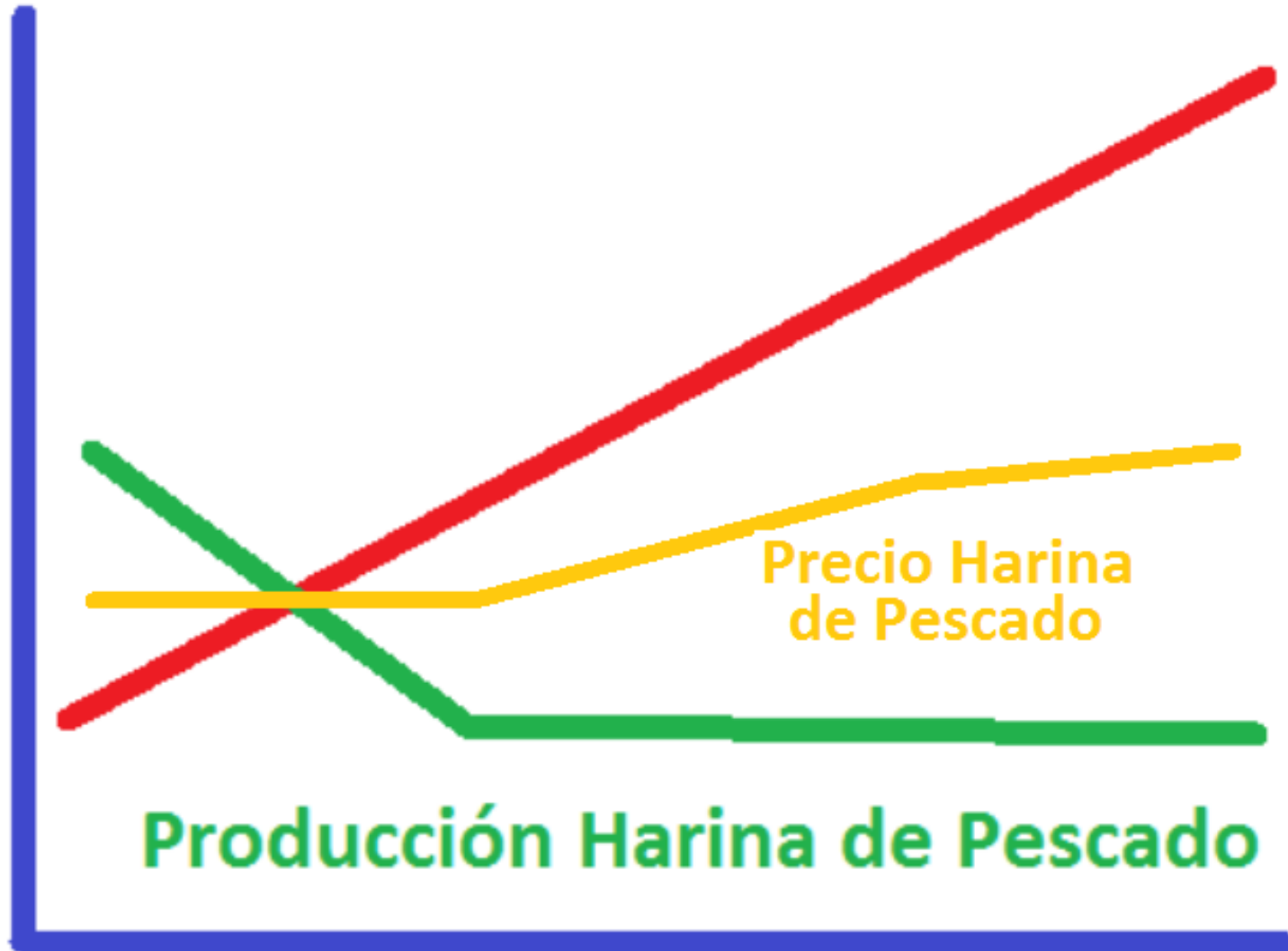
W44



World Yearly Catches (in thousand MT)												
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
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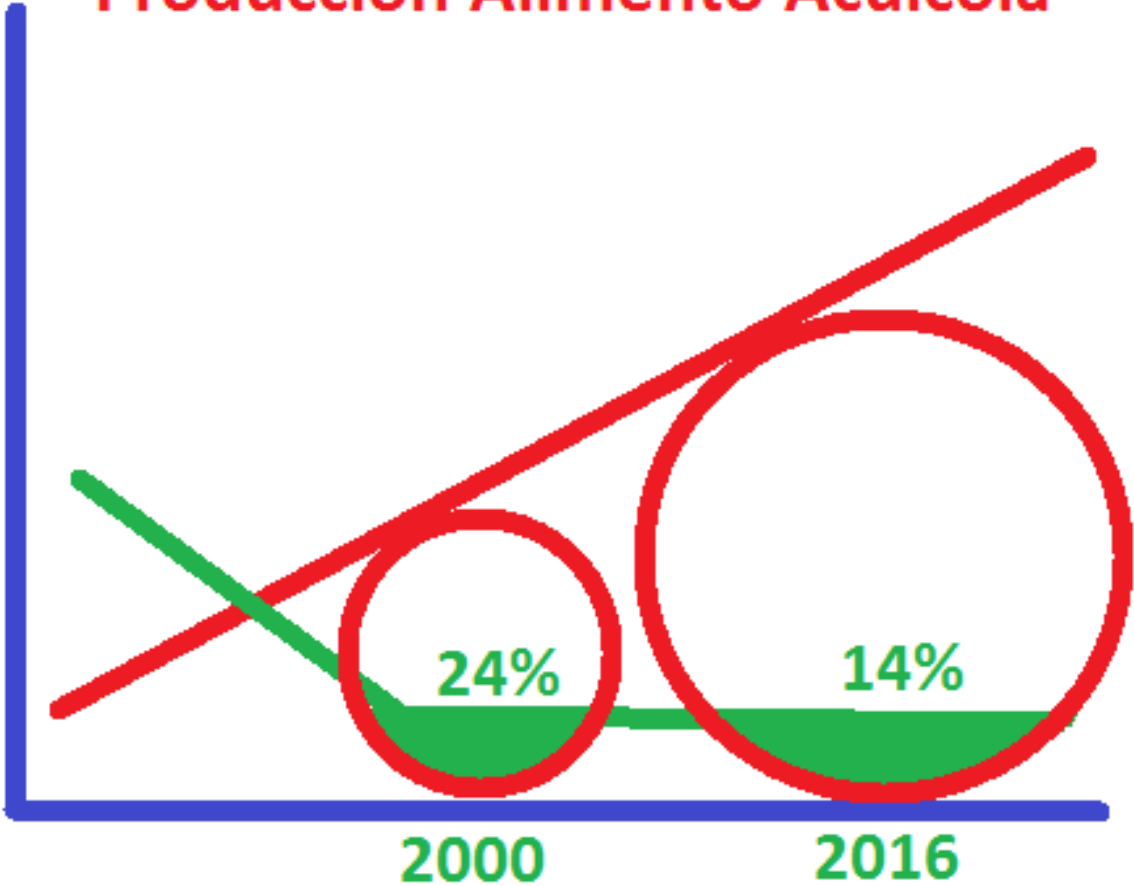
Producción Alimento Acuícola



Precio Harina de Pescado

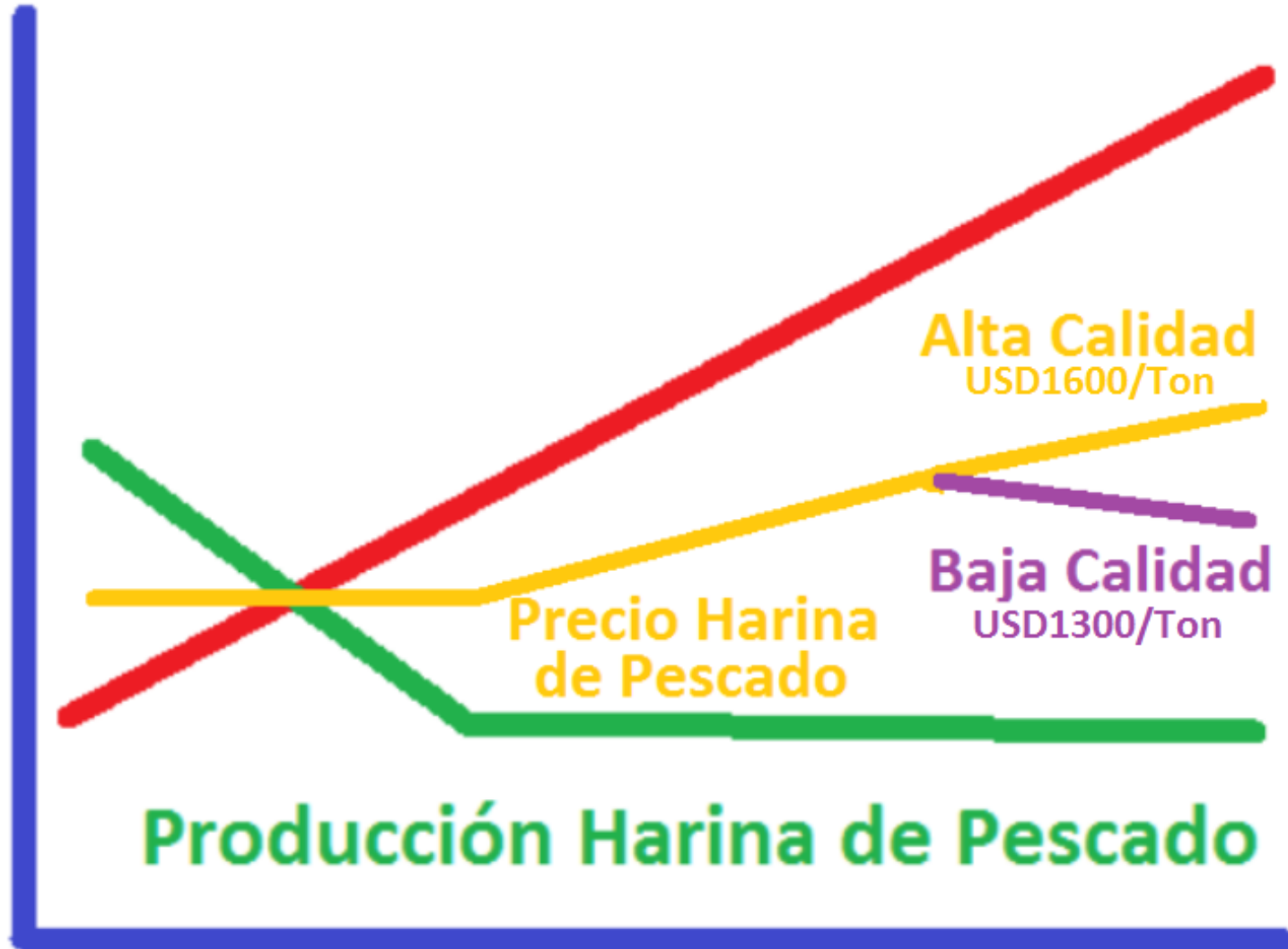
Producción Harina de Pescado

Producción Alimento Acuícola

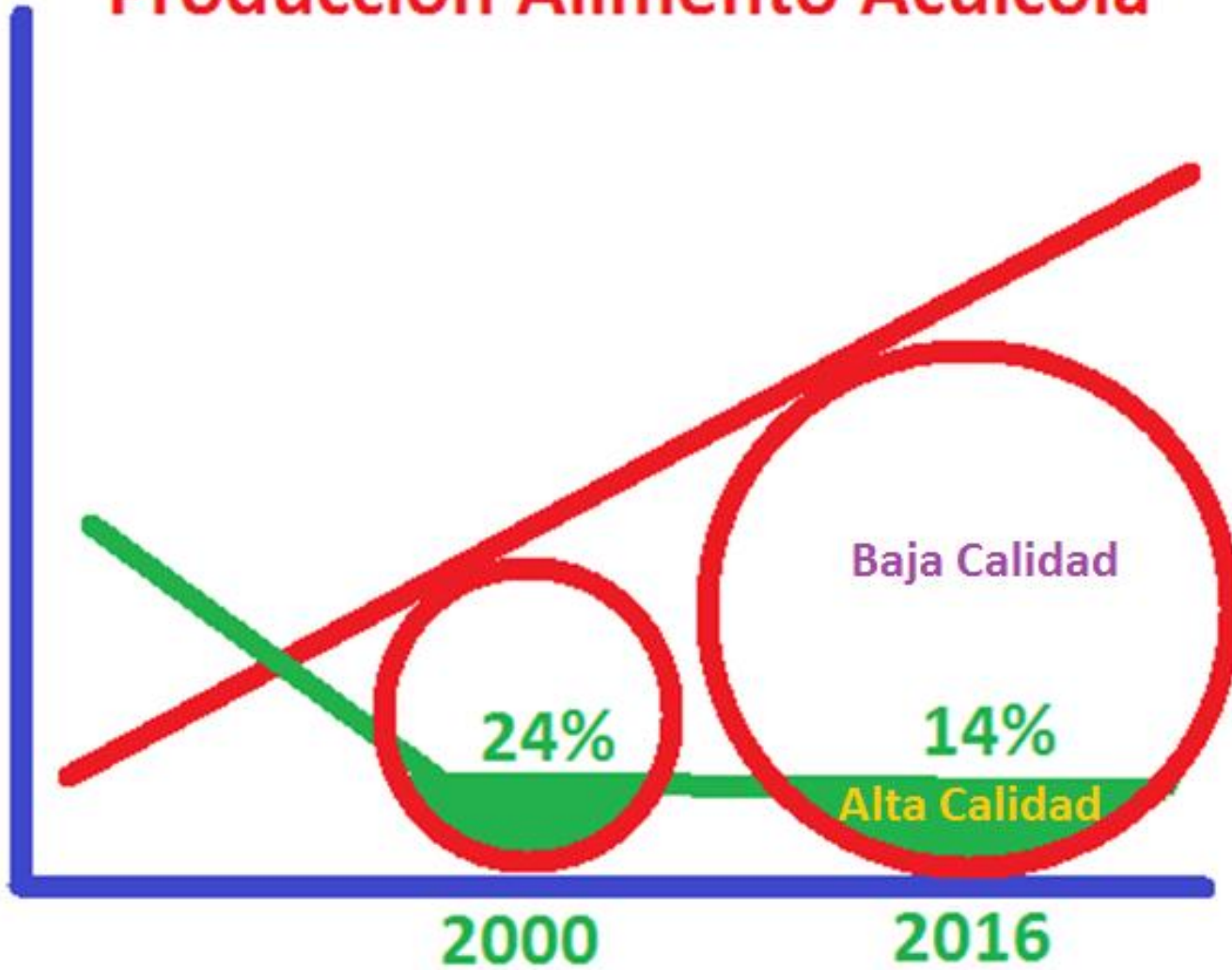


Producción Harina de Pescado

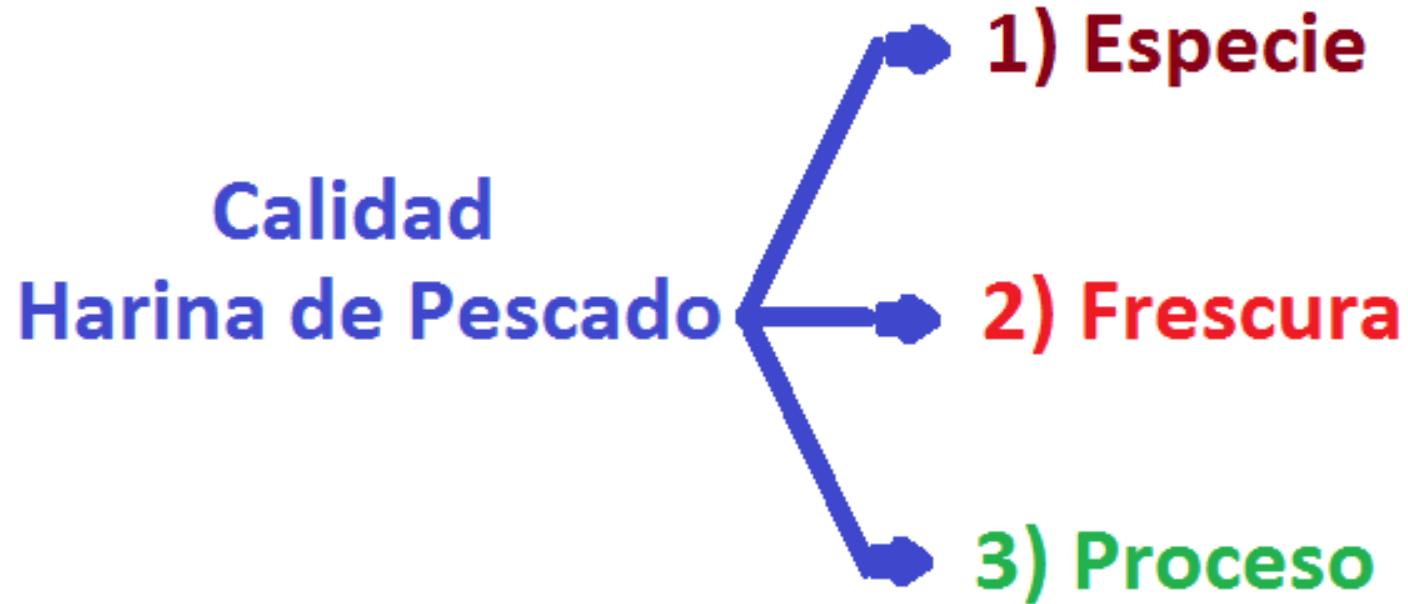
Producción Alimento Acuícola



Producción Alimento Acuícola



Producción Harina de Pescado

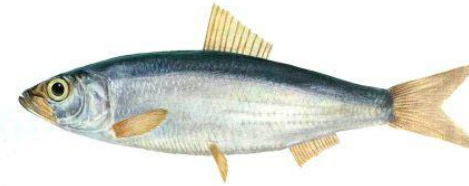


Raw Material

Jack Mackerel - Jurel
Trachurus murphyi



Commun Sardine
Strangomera bentincki



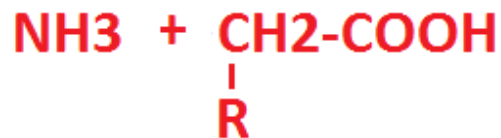
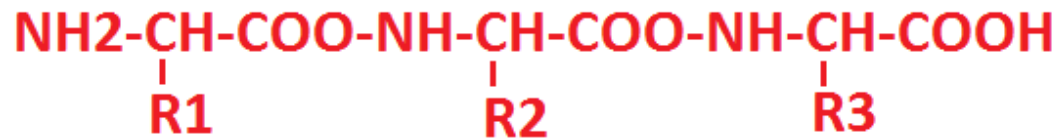
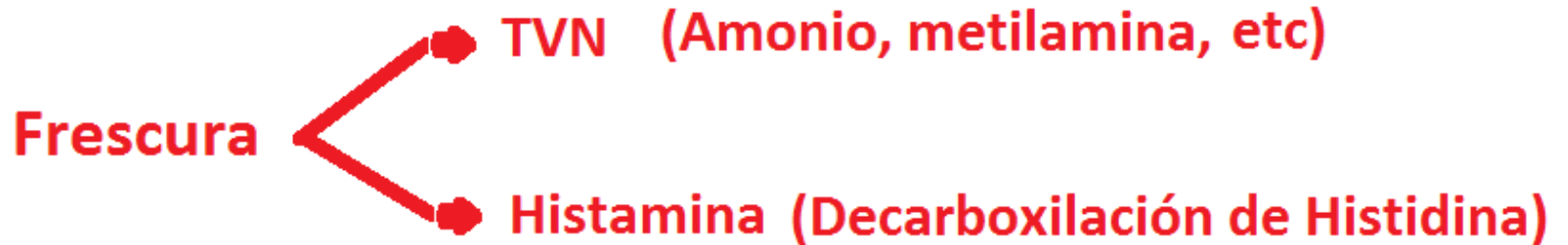
Anchovy
Engraulis ringens



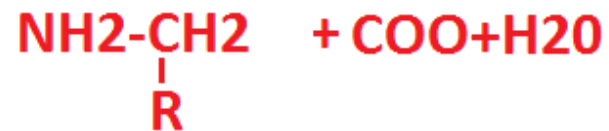
Calidad Harina de Pescado ➡ 1) Especie

	Lis	Met	His
Jurel	7.0	3.0	4.5
Sardina	6.0	2.2	3.0
Anchoa	6.0	2.3	3.0
Soya	3.0	1.0	1.0
Maíz	1.0	2.0	1.0
Pluma	2.0	2.0	1.0
Lupino	2.0	1.0	1.0
Sangre	8.8	1.0	5.0

Calidad Harina de Pescado ➡ 2) Frescura

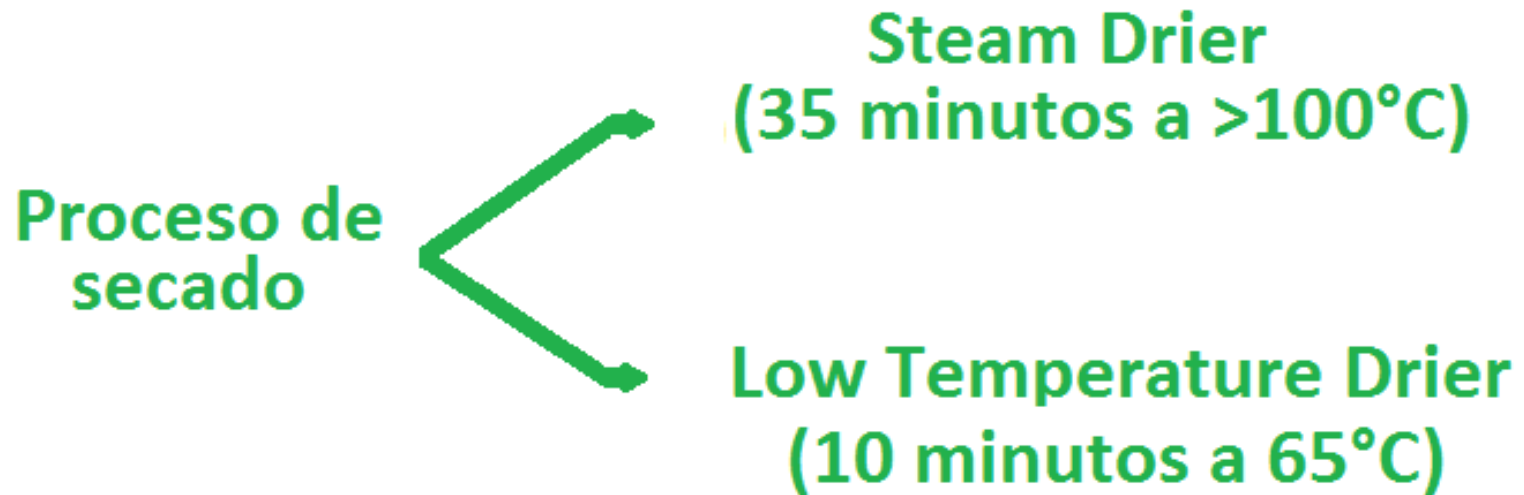


TVN

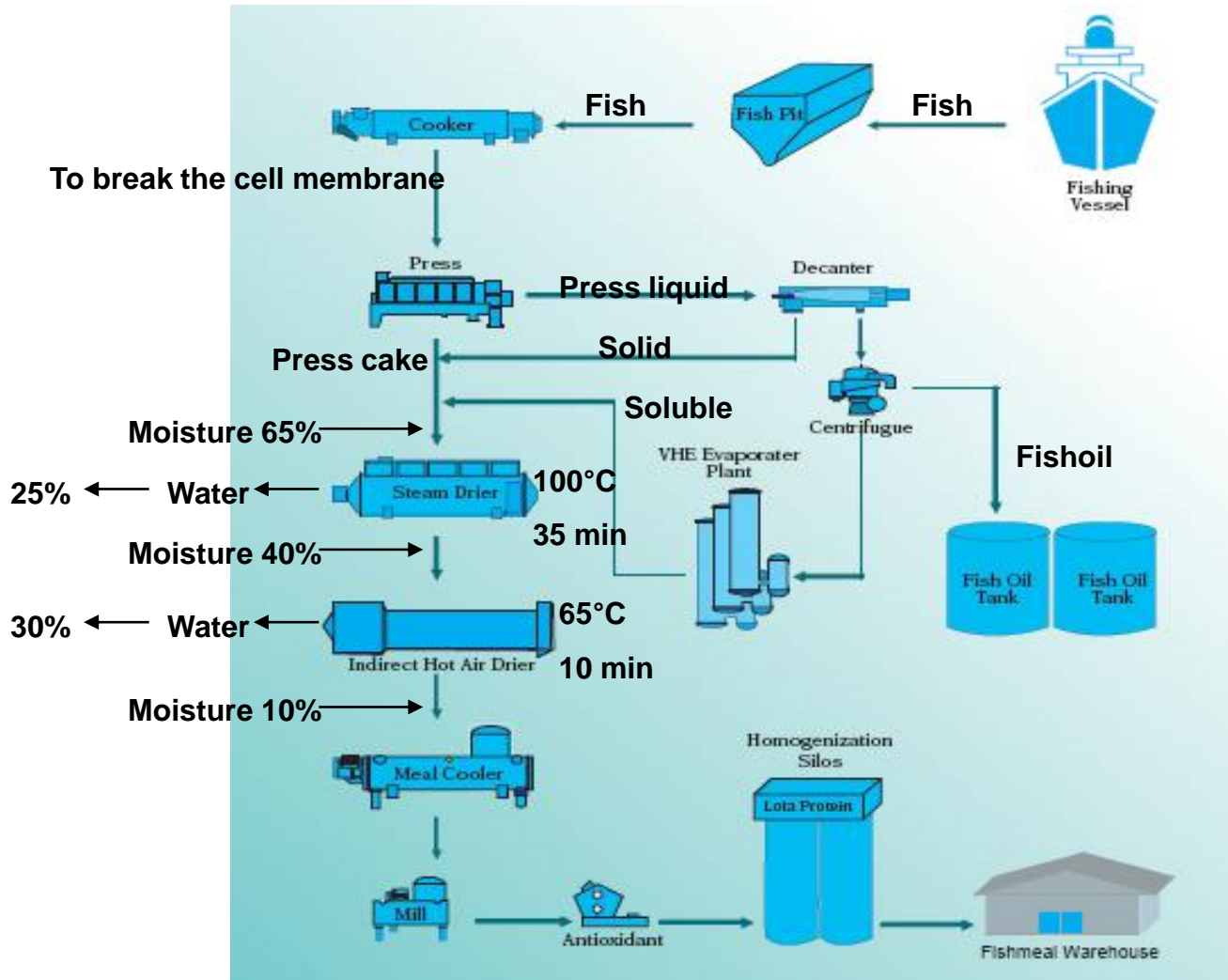


Histamina

Calidad Harina de Pescado ➡ 3) Proceso

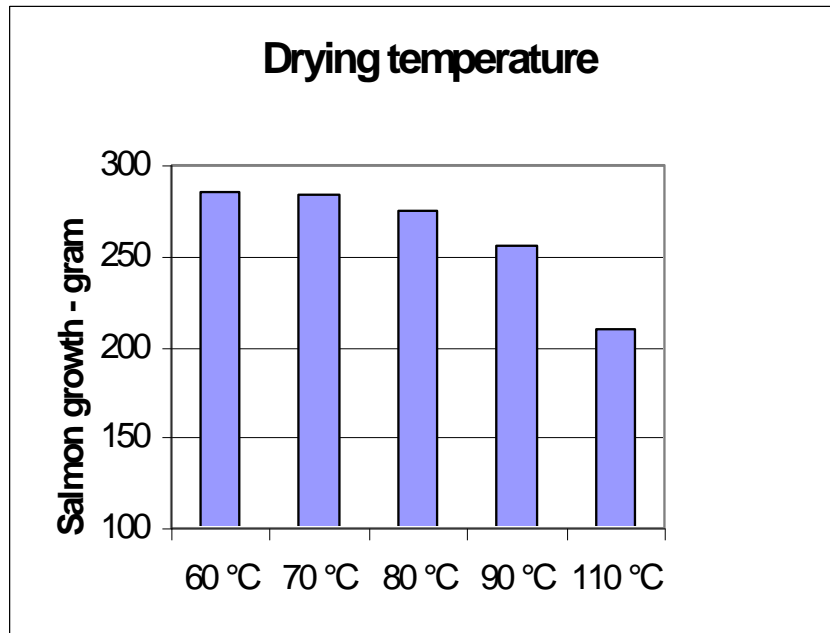


LOTA PROTEIN PROCESS



Proceso LT

➤ Mejora la digestibilidad de la harina de pescado, más proteína asimilada.



Weight Increase for different Animal Species Fed LT Fish meal Compared with Medium Quality Fish meal

Species	Improved growth
Small salmon	14%
Large salmon	17%
Turbot	17%
Weaned piglets	12%
Mink	13%

Source: The Norwegian Herring oil and meal research institute, SSF

Proceso LT

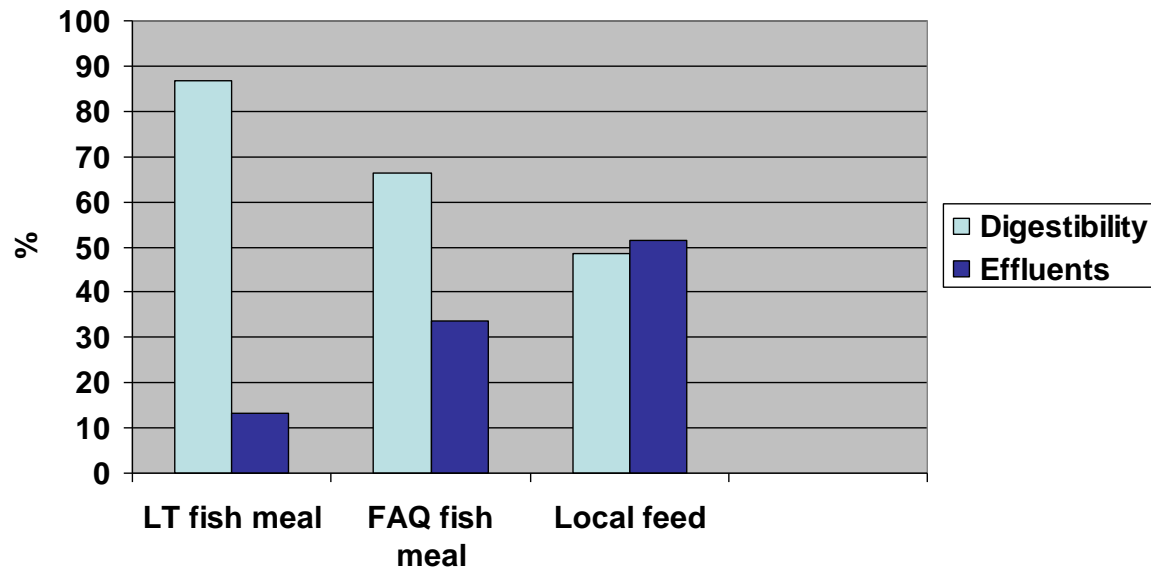
➤ Incrementa la disponibilidad de amino ácidos esenciales: Me, His, Lis

Digestible amino acids in fish meal (%)						
Fish meal	Trout in fresh water			Salmon in salt water		
	FAQ	Mediu m	LT		Steam dried	LT
Arginine	85	91	91	Arginine	89	95
Histidine	72	86	93	Histidine	84	95
Isoleucine	86	98	100	Isoleucine	84	95
Leucine	84	93	96	Leucine	87	95
Lysine	85	92	95	Lysine	82	95
Methionine	87	94	97	Methionine	86	95
Phenylalanine	82	89	92	Phenylalanine	84	93
Threonine	79	92	97	Threonine	79	93
Tryptophane	-	-	-	Tryptophane	53	89
Valine	78	95	99	Valine	84	94
Alanine	89	98	98	Alanine	87	94
Aspartic acid	70	85	96	Aspartic acid	68	90
Cysteine	-	-	-	Cysteine	76	88
Glutamic acid	88	97	100	Glutamic acid	84	95
Glycine	76	87	87	Glycine	75	87
Proline	82	89	90	Proline	84	89
Serine	65	96	100	Serine	84	91
Tyrosine	80	89	93	Tyrosine	83	95
Average	80.6	92,1	96,1		74	89

Proceso LT

➤ Disminuye materia fecal con menor impacto sobre el medio ambiente.

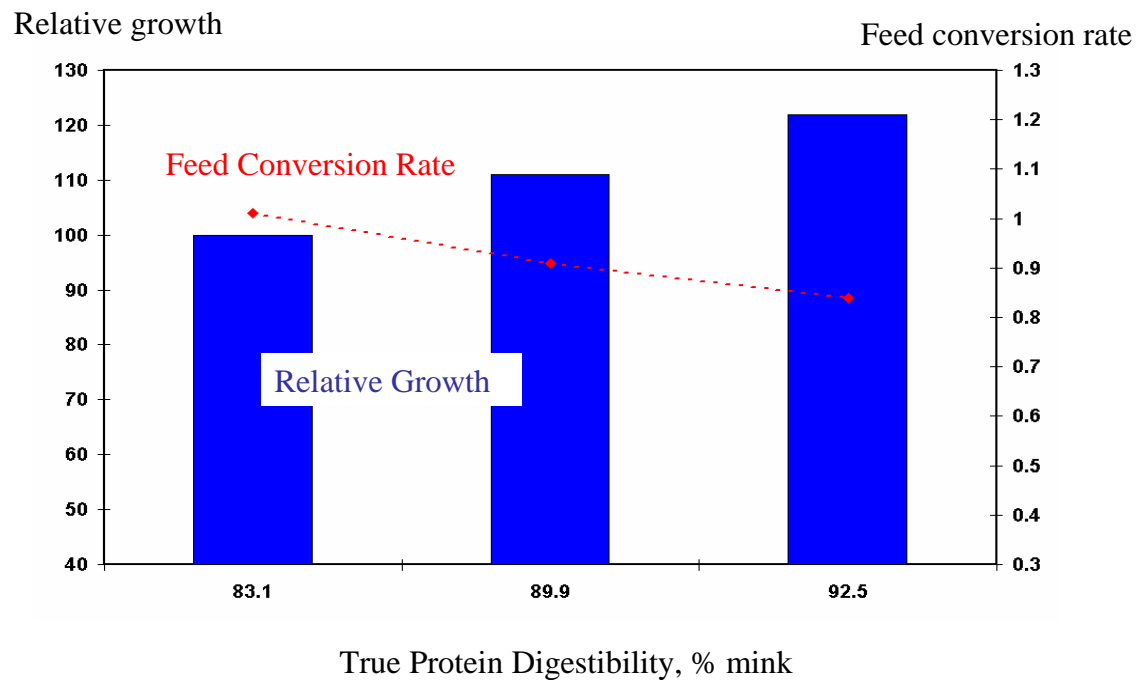
Phosphorus - Digestibility and Effluents

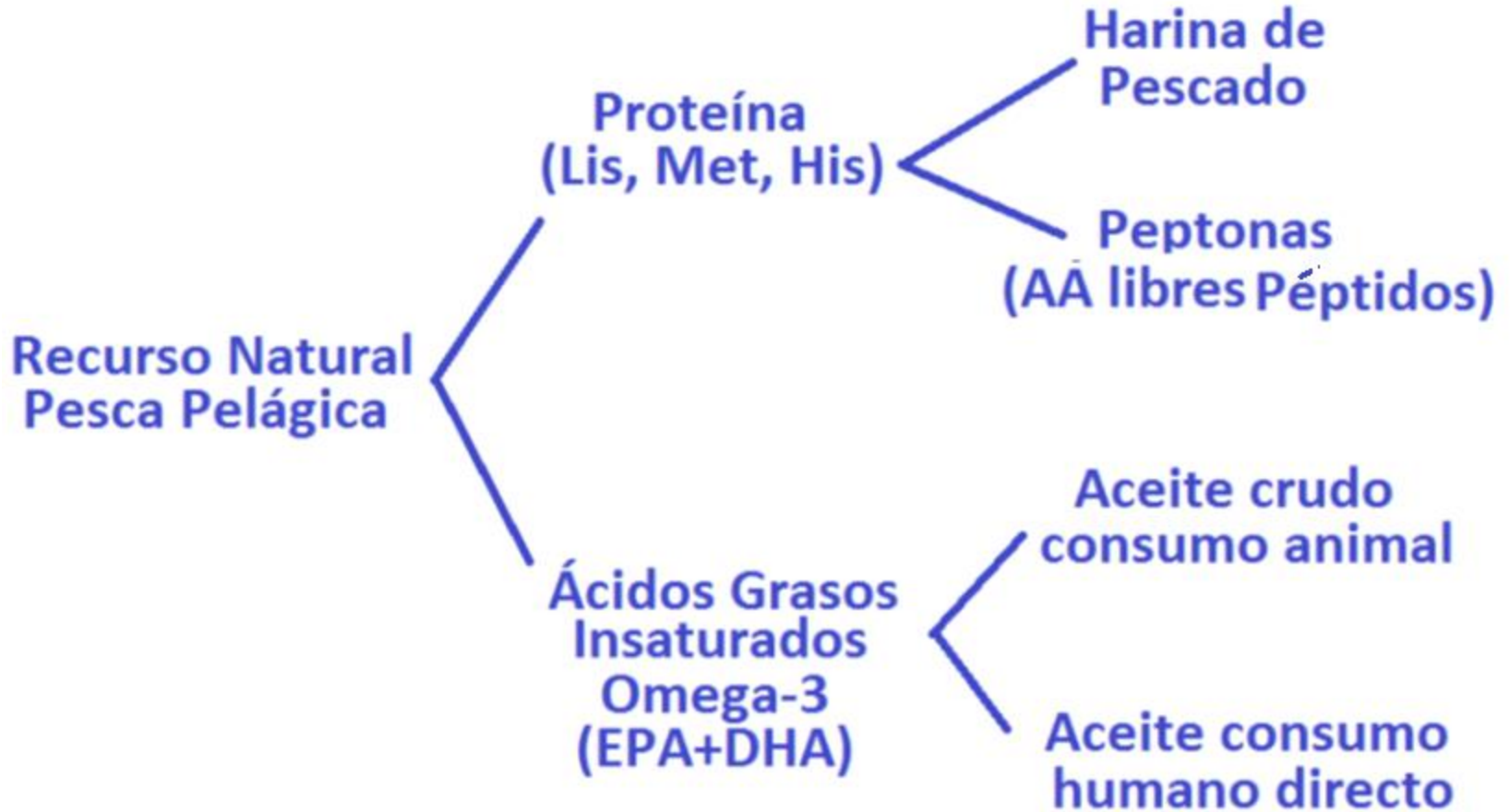


Proceso LT

➤ Mejora el factor de conversión animal y el factor de crecimiento.

Relative growth, Salmon vs protein digestibility, Mink







Thank you!