CICLO DE CHARLAS SOJA360

23 OCTUBRE 2020

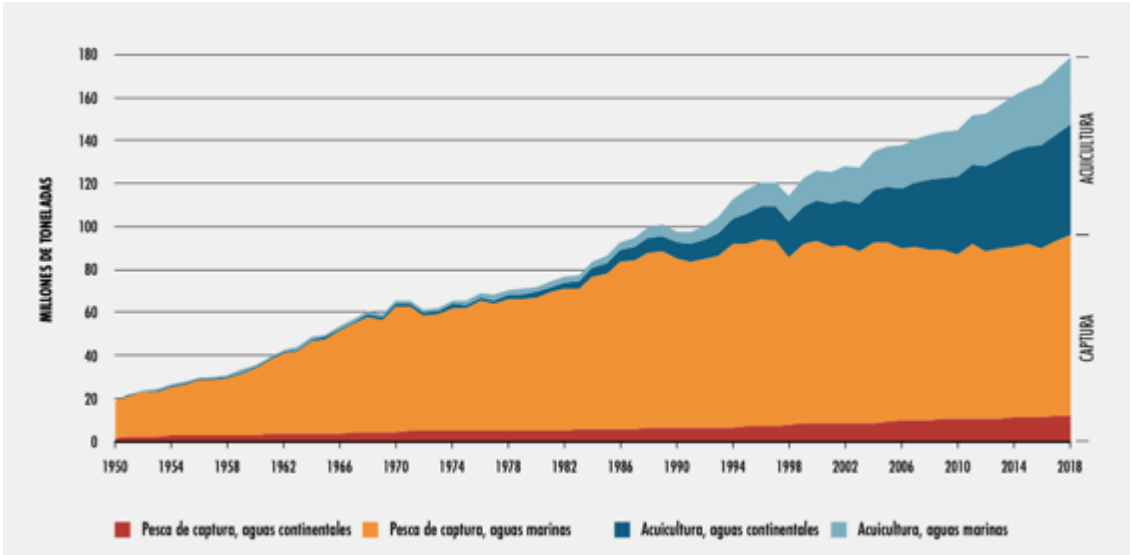
VALOR AGREGADO

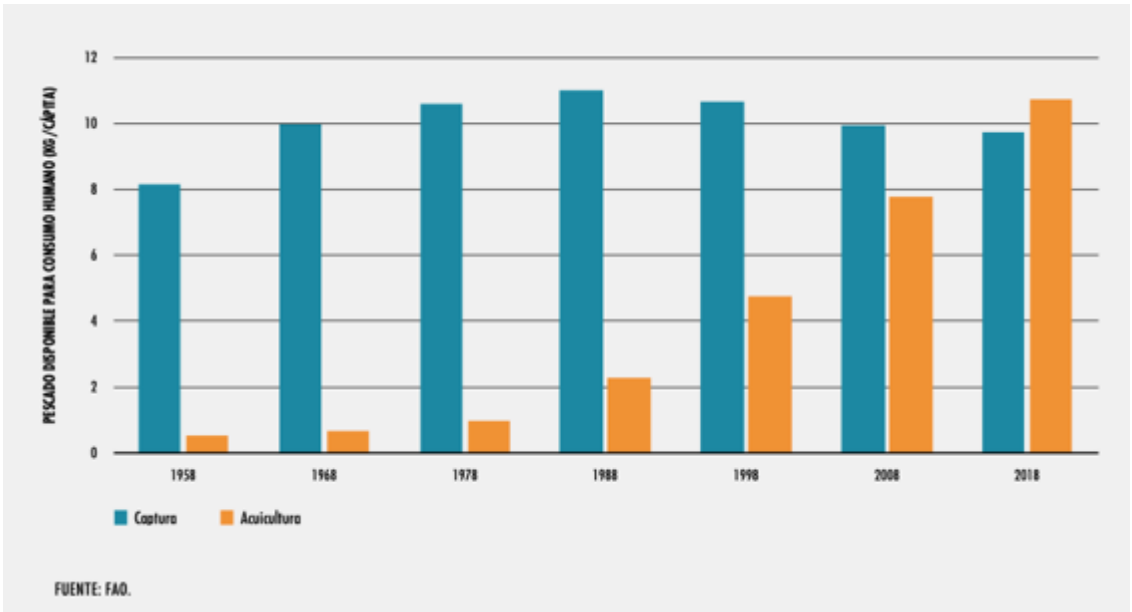
acsoja®

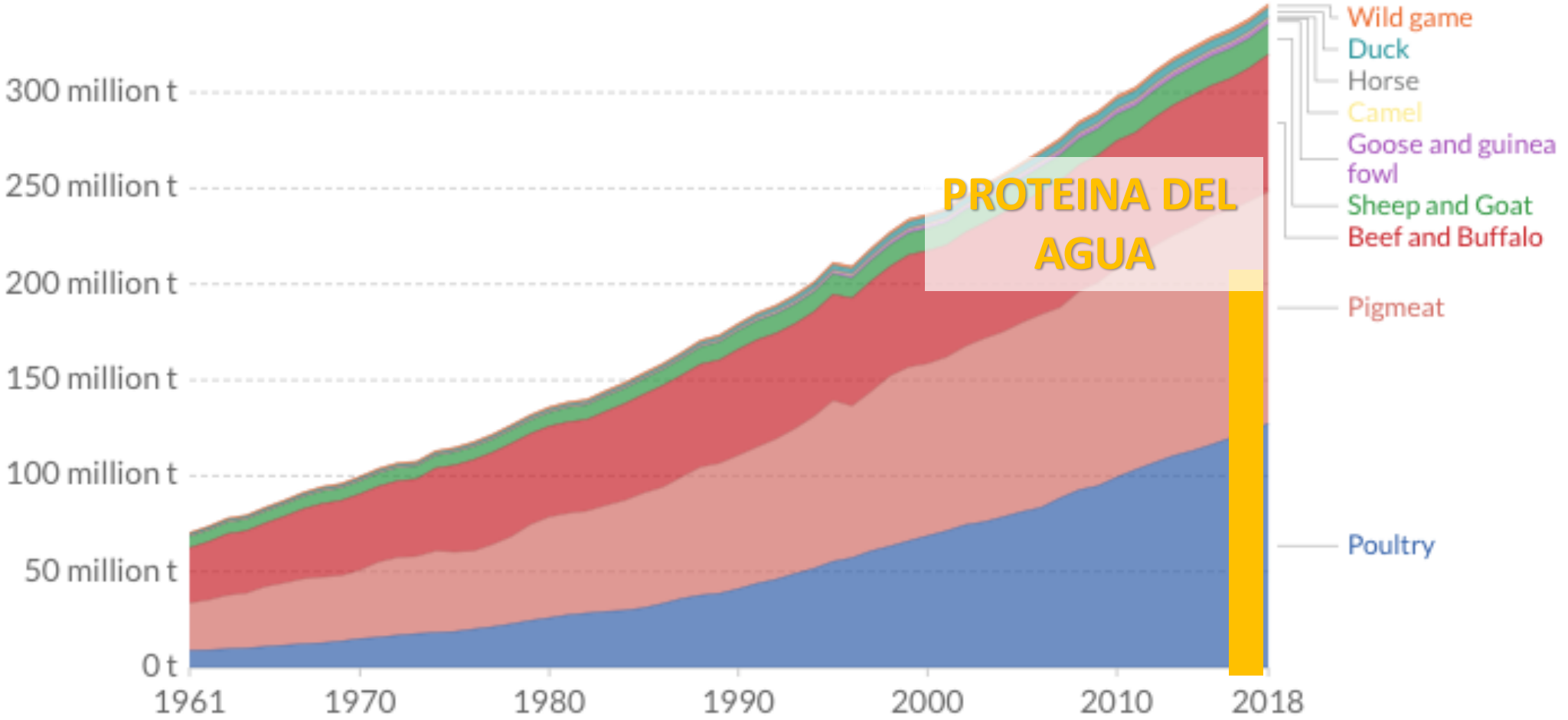
Asociación de la Cadena de la Soja Argentina

- CONTEXTO GENERAL ACUICULTURA
- PROYECCIONES GLOBALES
- USO DE SOJA EN DIETAS ACUICOLAS
- POTENCIAL EN ARGENTINA Y DESDE ARGENTINA AL MUNDO


Organización de las Naciones Unidas para la Alimentación y la Agricultura
2020
EL ESTADO MUNDIAL
DE LA PESCA
Y LA ACUICULTURA

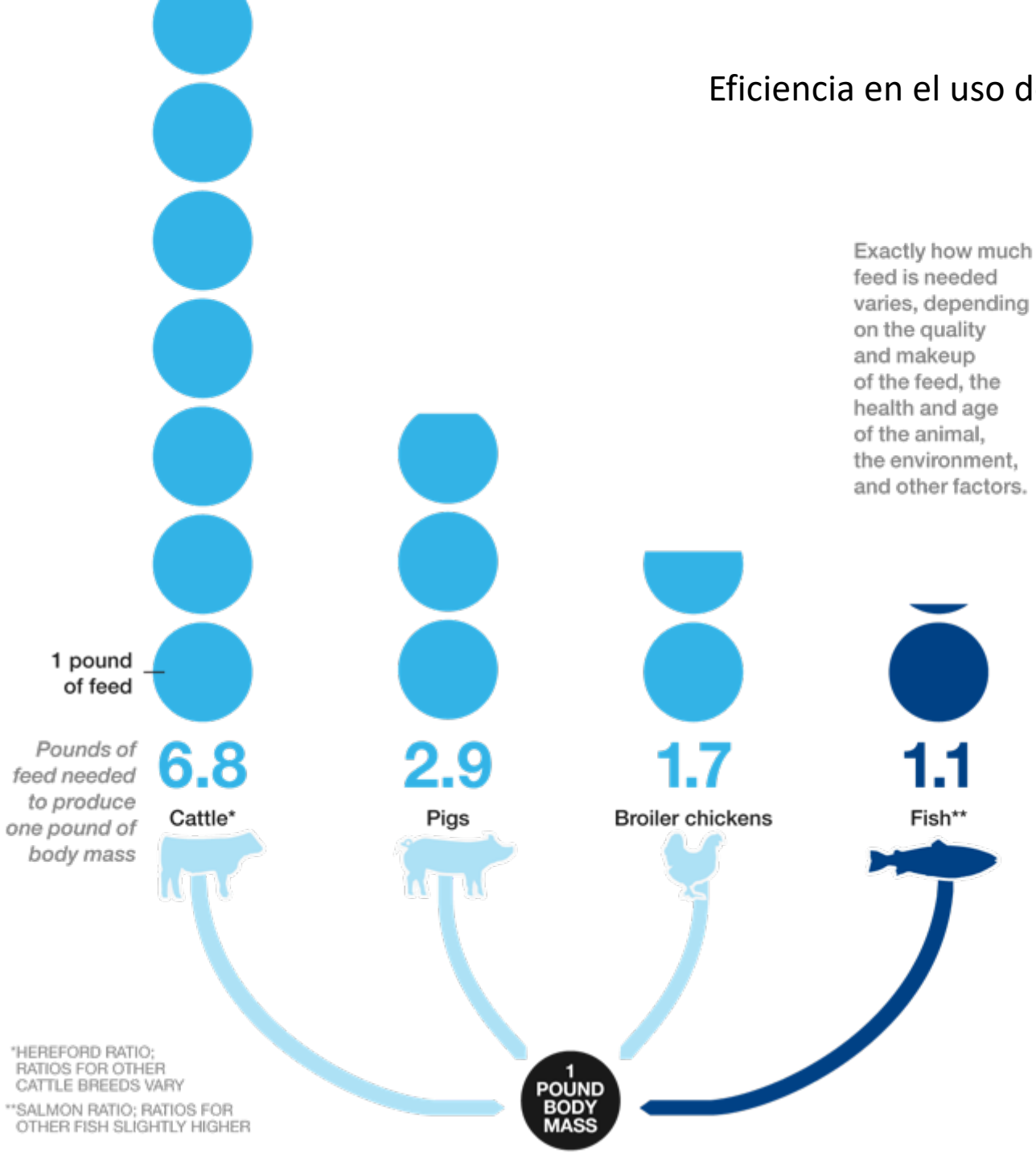

MILLONES DE TONELADAS
180
160
140
120
100
80
60
40
20
0
1950
1954
1958
1962
1966
1970
1974
1978
1982
1986
1990
1994
1998
2002
2006
2010
2014
2018
ACUICULTURA
CAPTURA
Pesca de captura, aguas continentales
Pesca de captura, aguas marinas
Acuicultura, aguas continentales
Acuicultura, aguas marinas


PESCADO DISPONIBLE PARA CONSUMO HUMANO (KG/CÁPITA)
12
10
8
6
4
2
0
1958
1968
1978
1988
1998
2008
2018
Captura
Acuicultura
FUENTE: FAO.



Source: UN Food and Agricultural Organization (FAO) OurWorldInData.org/meat-production • CC BY
Note: Total meat production includes both commercial and farm slaughter. Data are given in terms of dressed carcass weight, excluding offal and slaughter fats.

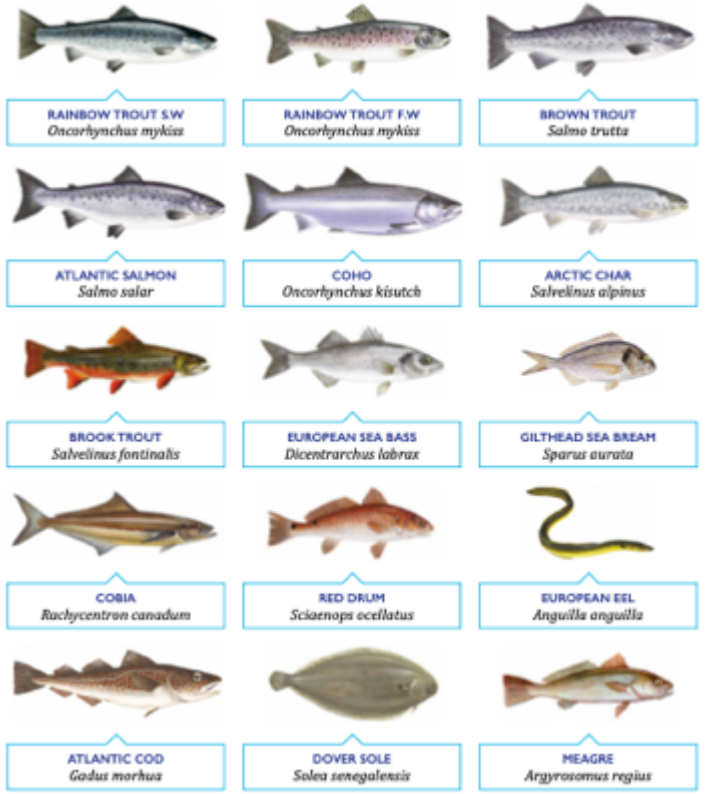
Eficiencia en el uso de alimento balanceado (FCR)



DIVERSIDAD DE ESPECIES

TIERRA

AGUA



PROYECCIONES 2050

DEMOGRAFIA – CAMBIO CLIMATICO -ALIMENTOS

+50 % DE COMIDA AL 2050

10% MAX.

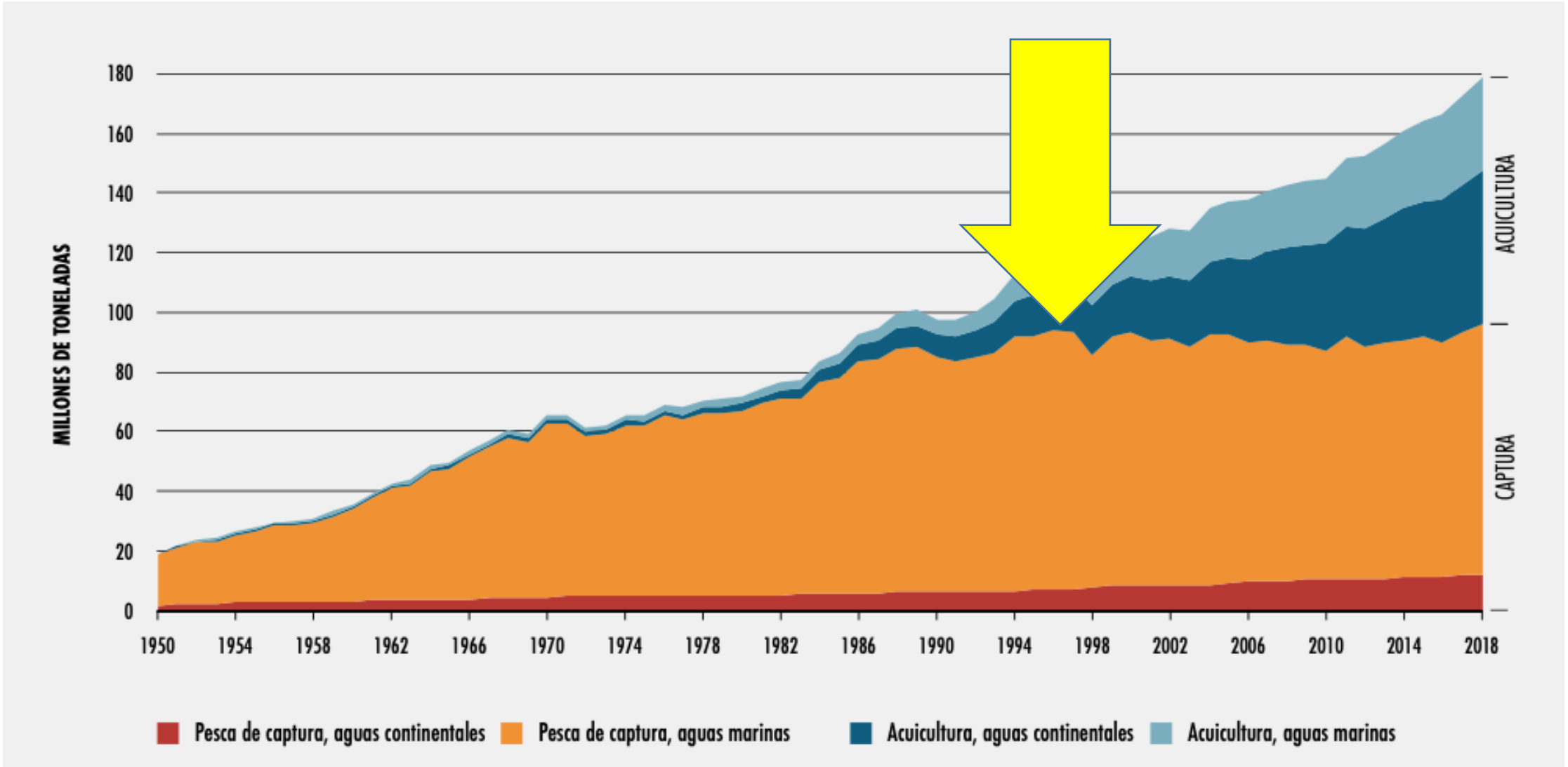
Desperdicio de alimentos anual a nivel mundial

“ Un número cada vez mayor de países están alcanzando un nivel alarmante de escasez de agua…”

“El cambio climático y el incremento asociado a eventos extremos constituyen graves riesgos para la seguridad alimentaria”

1.300.000 TN

Desde el año 1996 la pesca comercial no pudo aumentar sus volúmenes de captura y casi el 90% de las especies que se pescan están explotadas plenamente o sobreexplotadas



La pesca comercial tampoco podrá sostener el nivel de demanda futura de proteínas

COMISION DE PESCA UE
La Acuicultura debe crecer!!

*" La **ACUICULTURA** representa la Mayor oportunidad de inversión del siglo 21… PETER DRUCKER*

Will the Oceans Help Feed Humanity?

CARLOS M. DUARTE, MARIANNE HOLMER, YNGVAR OLSEN, DORIS SOTO, NÚRIA MARBÀ, JOANA GUIU, KENNY BLACK, AND IOANNIS KARAKASSIS

Constraints on the availability of freshwater and land plants and animals to feed the 9.2 billion humans projected to inhabit Earth by 2050 can be overcome by enhancing the contribution the ocean makes to food production. Catches from ocean fisheries are unlikely to recover without adequate conservation measures, so the greater contribution of the oceans to feeding humanity must be derived largely from mariculture. For the effort to be successful, mariculture must close the production cycle to abandon its current dependence on fisheries catches; enhance the production of edible macroalgae and filter-feeder organisms; minimize environmental impacts; and increase integration with food production on land, transferring water-intensive components of the human diet (i.e., production of animal protein) to the ocean. Accommodating these changes will enable the oceans to become a major source of food, which we believe will constitute the next food revolution in human history.

Keywords: aquaculture, food, animals, plants, bottlenecks

The human population is projected to reach 9200 million by 2050 (UN 2007), which is within estimates of the maximum carrying capacity of the planet (Cohen 1995). A fundamental question for science is whether it is possible to increase food production to meet the demands of a human population of that magnitude.

There is little room for optimism. Available water resources appear insufficient for agriculture to meet the food demands of 9200 million people (Cohen 1995, CAWMA 2007). The present population already experiences water stress (CAWMA 2007), which is exacerbated by the interactive effects of population growth and climate change (Vörösmarty et al. 2000). In addition, global fisheries landings have been declining since the mid-1980s (Pauly et al. 2003), contributing to the current food production crisis. Under this scenario, marine aquaculture (hereafter mariculture), the food-producing sector least dependent on freshwater availability (Verdegem et al. 2006), will be enlisted to help feed humanity in the 21st century (Marra 2005). Global terrestrial production and marine primary production are comparable in magnitude (Field et al. 1998), but marine food now contributes only 2% to the human food supply (FAO 2006a), as the development of controlled food production in the ocean lags several millennia behind that on land (Duarte et al. 2007). Aquaculture production currently faces important challenges (Diana 2009) that may hinder its future development. Because large-scale domestication of the ocean should be a mainstay of the response to future food crises (Marra 2005), it is imperative to determine what is required to bring about this domestication. Here we build on recent analyses (Diana 2009) to examine the prospects for mariculture becoming a major force to meet growing human food demands, and we analyze the bottlenecks and challenges mariculture must overcome.

Ceilings to agricultural food production

Food sufficiency requires some 900 cubic meters (m^3) of water per person per year (Falkenmark 1997), and about 9000 to 14,000 km^3 per year are available for human use (Cohen 1995). Thus, a maximum of 10,000 million to 15,500 million people can be supported. Indeed, estimates of the maximum human population that Earth can sustain range from 6000 million to 15,000 million, with a median of about 10,000 million people (Cohen 1995). Far fewer people can be supported if less water is available for agriculture and nutrient requirements—particularly the fraction met by meat intake—increase.

Indeed, the percentage of total water use co-opted by agriculture declined from 90% to 70% during the 20th century (FAO 2006a, CAWMA 2007), and agricultural production of nonfood commodities, such as cotton and biofuel, is increasing (CAWMA 2007). Dietary shifts, forecasted to involve a per capita 25% increase in meat intake and a 10% increase in calories over the next decades (WHO 2003), result in more per capita water use, as meat production

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"Como sociedad debemos estar preparados para enfrentar los cambios sociales más importantes que se requieren para adaptarse a la próxima gran revolución en la producción de alimentos: ***el traslado de la producción de proteína animal de la tierra al mar"***

"La acuicultura marina debe cumplir con estos retos para que los océanos se conviertan en una fuente importante de alimentos para los seres humanos, para convertirse en la próxima revolución en la provisión de alimentos para humanos"

CONSUMPTION OF TODAY

40% Animal proteines

55% Plant proteines

5% Marine proteines

CONSUMPTION OF TOMORROW

5% Animal proteines

55% Plant proteines

40% Marine proteiner

+ 40 MM TON - 2030

2030 --- 215 MM TON (EXCL.ALGAS)

150 MM TON – DE ANIMALES QUE CONSUMEN ALIMENTO

LA SOJA EN LAS DIETAS ACUICOLAS

Cuanta soja pueden incorporar los peces en sus dietas?

OPEN ACCESS Freely available online

Journal of
Aquaculture Research & Development

Review Article

Effects of Replacing Fishmeal with Soybean Products in Fish and Crustaceans Performance

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ABSTRACT

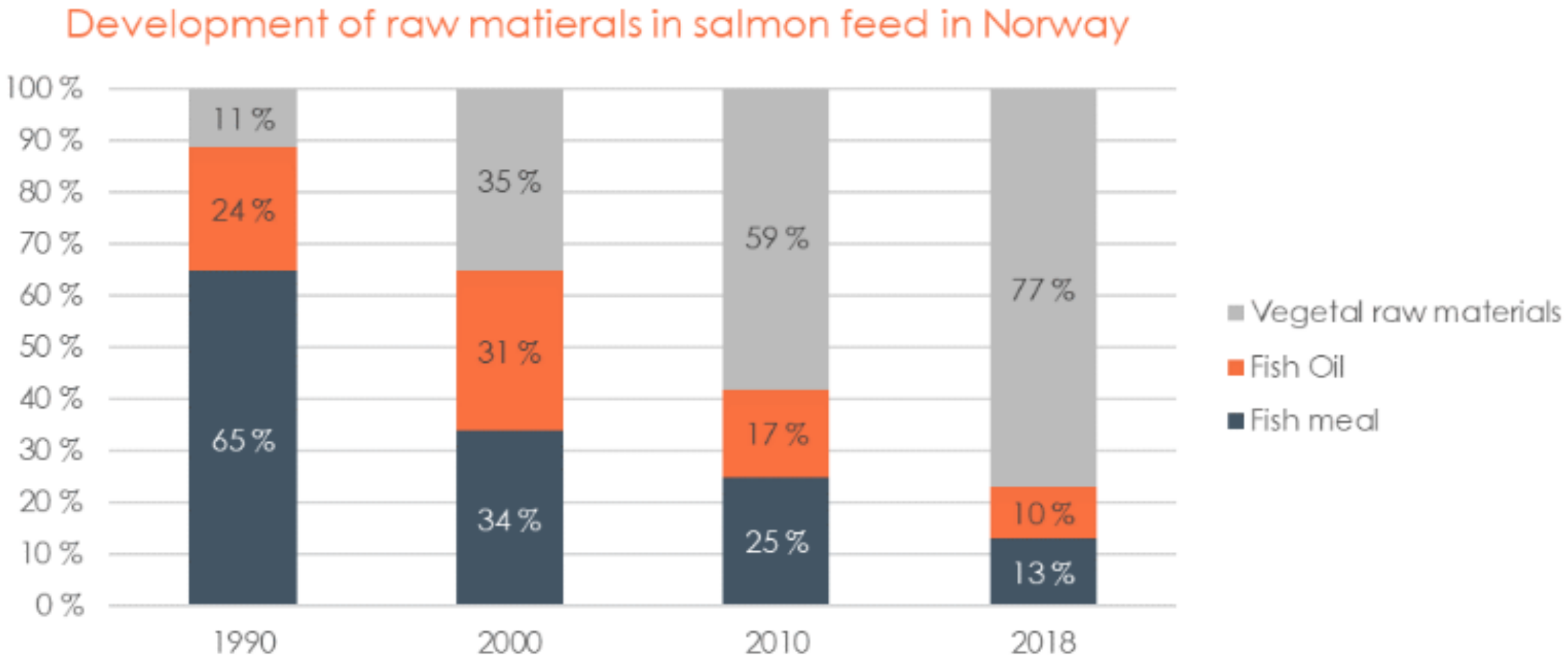
Fish meal (FM) is a principal dietary protein source in aquafeed. The rapid development of aquaculture resulted in high demand and a shortage of (FM) supply. The reason mentioned above has led to a search for an alternative protein sources as (FM) replacement in aquafeeds. Amongst plant protein ingredients, soybean meal (SB) is suggested as the most nutritive plant protein source but some contains high concentration of anti-nutritional factors. Among most soybean products compared with FM, soybean protein concentrate (SPC) is most suitable to replace fishmeal in aquafeed because of its high protein content and better amino acid profile than other soybean products such as soybean meal (SBM). Moreover, more SPC can be used to fully or partially replace FM as compared to SBM without adverse effects on growth performance and health condition in fish and crustaceans. This review reveals that SPC has positive effect on fish and crustaceans performance, gene expression and pathways. This information will help reduce the use of fishmeal by replacing it with SPC in aquafeed and also help to improve growth and health of fish and crustaceans.

Keywords: Aquafeed; Fish meal; Gene expression; Growth; Soybean Meal (SBM); Soybean Protein Concentrate (SPC)

INTRODUCTION

Production of world aquaculture in 2016 was 110.2 million tonnes with estimated value at USD 243.5 billion FAO [1]. This implies that aquaculture is important and also plays a major role in the world economy and market. Aquatic animals such as fish and crustaceans provide high-quality animal protein, selenium, and other essential nutrients in human and animal diets for healthy living. Despite their vital contribution to the global human and animal nutrition, culturing aquatic animals faces many challenges and among them is the high cost of feed [2], and increasing disease outbreak during culturing [3]. The price of aquafeed is always determined by the sources of ingredients and levels of nutritional composition that the feed possesses. Understanding fish and crustaceans nutrition is essential to aquaculturists when making decisions because the cost of the diet represents a large portion of the commercial fish and shrimp production cost. Similar to other terrestrial animals, these aquatic organisms requires a certain level of quality protein in their feed for maximum growth and healthy living in their culturing environment. Fish meal (FM) is a major dietary source protein for farmed marine fish and shrimp due to its high digestibility and good amino acid profile Sookying et al. [2]. Most fishes used in FM production are pelagic fishes from marine waters. FAO [4] reported that most world fish stocks of pelagic marine fish are either entirely or over-exploited. FM production experiences shortages from its raw material resources, decreasing the total FM production capacity make it difficult sustain the aquaculture industry. Such shortages cause low supply, which increases FM cost in the formulation of the aquafeed. High FM in aquafeed increases growth of aquatic animal but doubles production cost. Whenever this cost reflects on the selling price of farmed fish or shrimp, consumers are not willing to buy fish or shrimp product leading to reduced profit margin and unsustainability or non-expansion of the industry Sookying et al. [2]. In addition to economic incentives from replacing FM, significant pressure to improve the environmental sustainability of aquaculture has affected feed formulation practices in recent

- EN PECES DE AGUA DULCE LOS NIVELES DE INCLUSION DE HARINA DE SOJA PUEDEN LLEGAR AL 55% Y EN PECES MARINOS HASTA UN 30%
- Algunas especies como la Lubina (*Morone saxatilis*) pueden incorporar grandes cantidades de soja, hasta un 80% del contenido proteico puede ser proteína de de soja.
- Las dietas actuales en Chile para salmónidos utilizan hasta 18% de harina de soja y 12 % de aceite de soja
- Los peces cultivados en el NorEste Argentino, Pacú, Surubí, etc, incluyen un 30% de soja en sus dietas



Clara tendencia a eliminar proteínas de origen marino y disminuir el índice FIFO (fish in fish out), aumento significativo del uso de insumos de origen vegetal

Salmofood en vías de lanzar dieta sin harina ni aceite de pescado

"Hemos dado el último paso en la búsqueda por disminuir la dependencia de insumos marinos", afirmó Pablo Leyton de Vitapro Chile.

NEGOCIOS E INDUSTRIA, PROVEEDORES

2030

150 MM TON – DE ANIMALES ACUATICOS QUE CONSUMEN ALIMENTO

180 MM TN ALIMENTO

160 MM TN VEGETAL

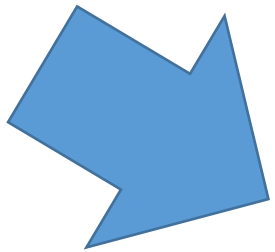
45 MM TN SOJA

BOLSA
DE COMERCIO
DE ROSARIO

Cuadro N°6: ¿Quiénes compran Harina de Soja a Argentina?

En millones de toneladas

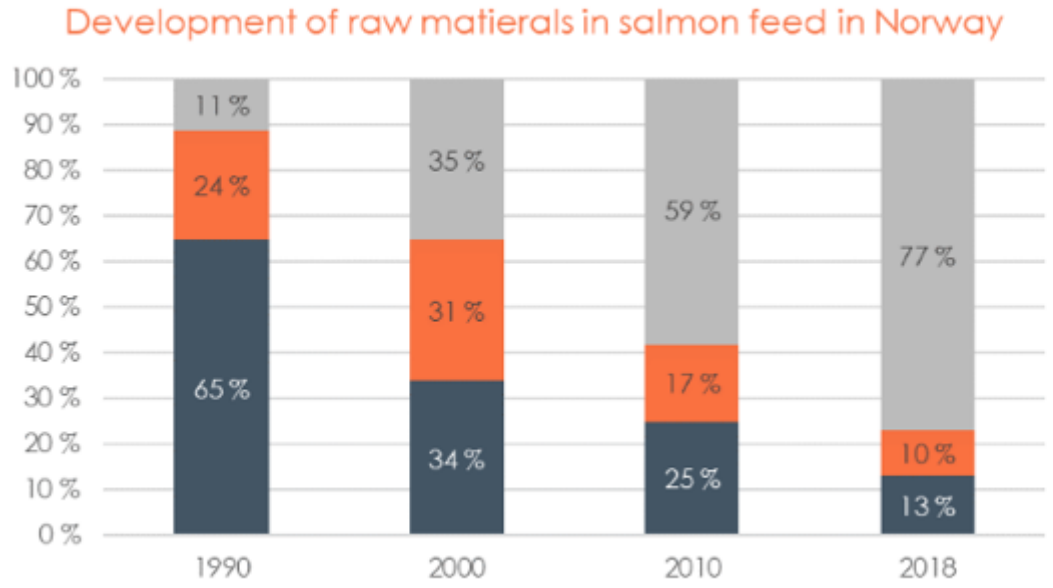
Rubro	Oct-Set. 2018/19p	Participación % en el total
1 Vietnam	2.961.503.340	12%
2 Indonesia	2.429.782.878	10%



Rank	Country	Value
1	China	63,700,000.00
2	Indonesia	16,600,000.00
3	India	5,703,002.00
4	Vietnam	3,634,531.00

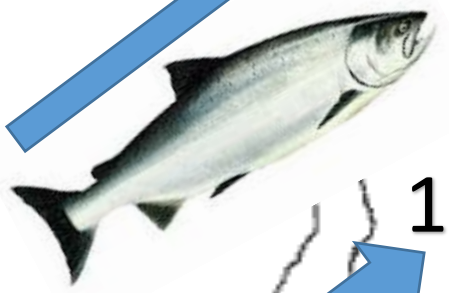
Lo mas probable es que gran parte de la Soja termine en un lugar como este…

POTENCIAL EN ARGENTINA Y DESDE ARGENTINA AL MUNDO



SOJA 30 % (H/A)
GIRASOL
TRIGO
MAIZ

90.000 tn

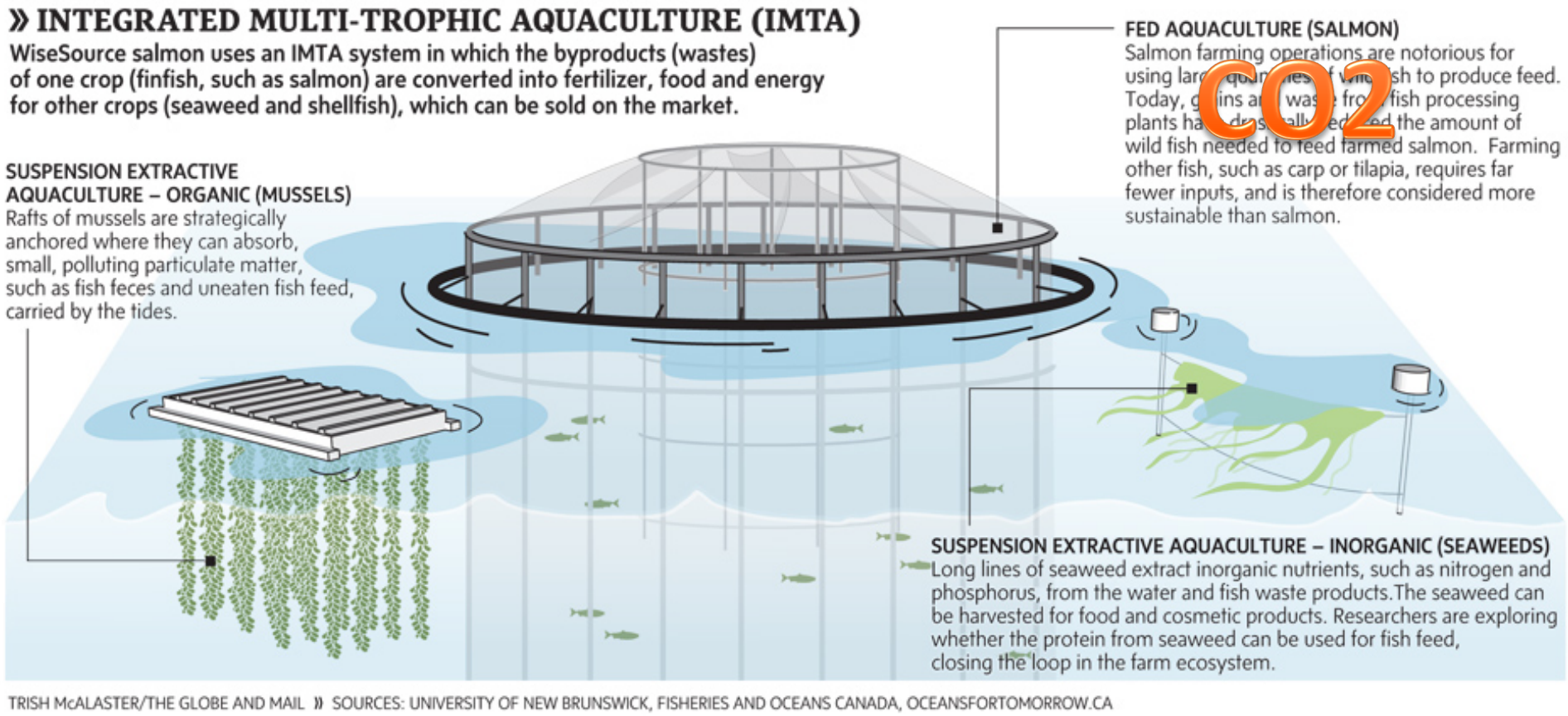


15.000 tn

600.000.000 usd

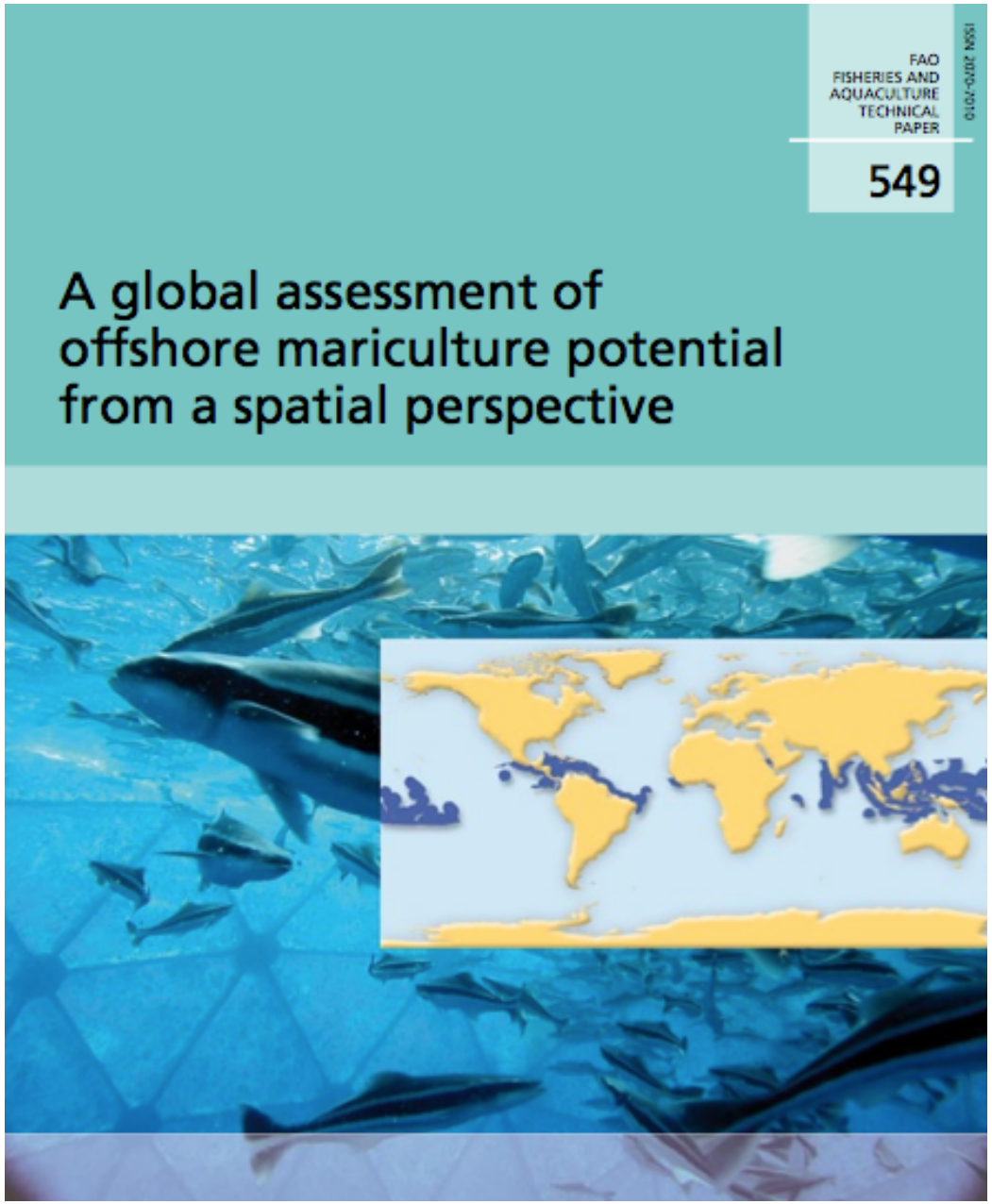
SOJA
GIRASOL
TRIGO
MAIZ

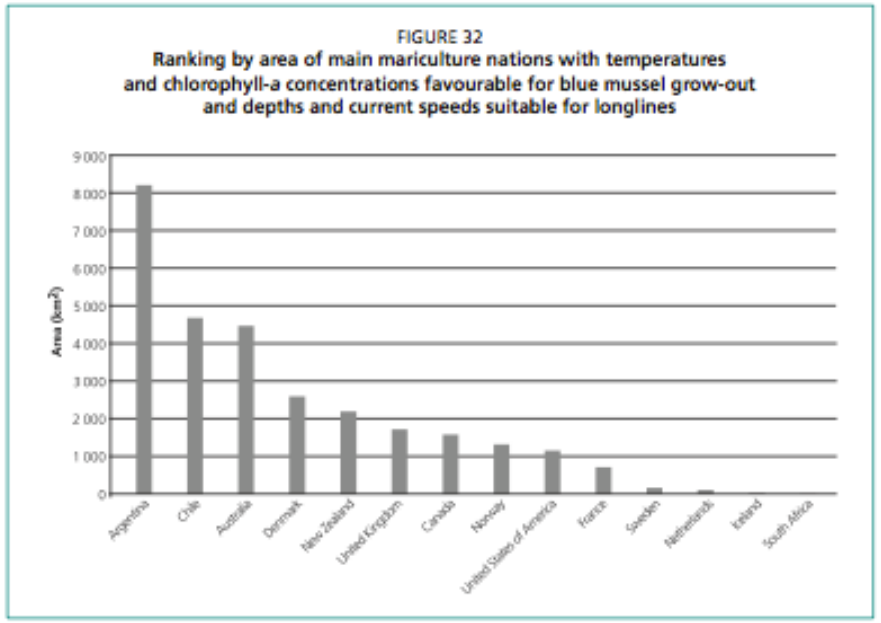
océano atlántico

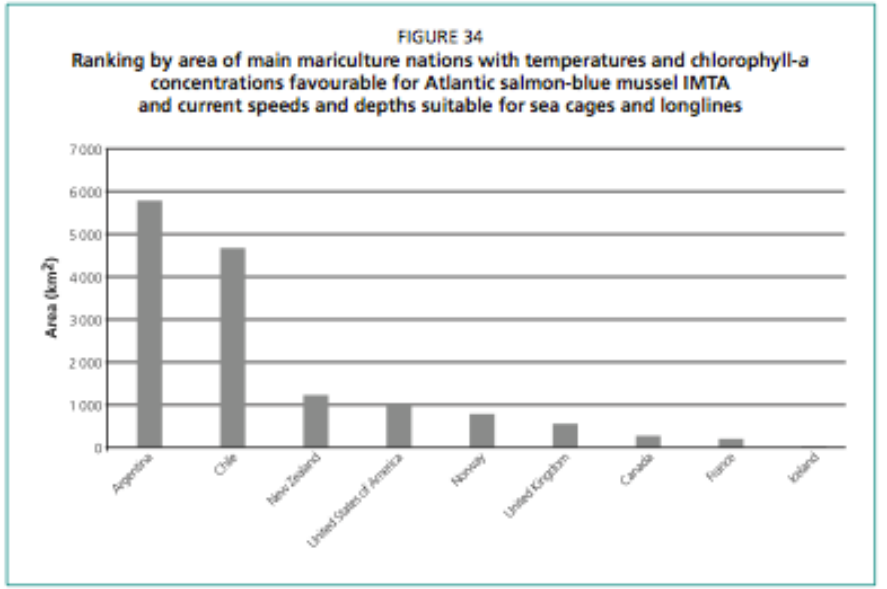


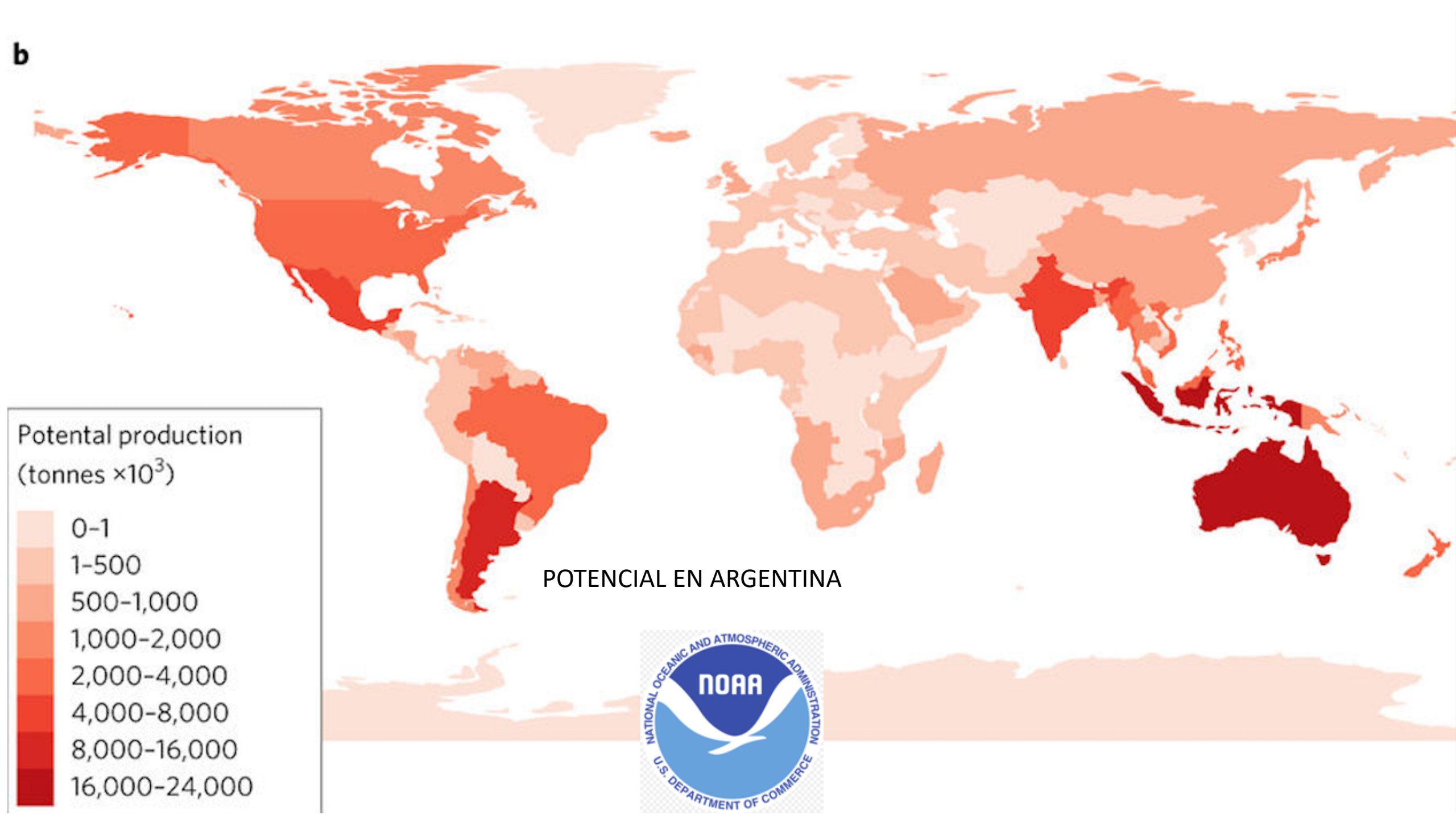
"La Acuicultura Multitrófica Integrada representa una enorme ventaja en términos de desarrollo sustentable. Por ejemplo, el rendimiento de los bivalvos y macroalgas puede aumentar en un 15% y 50%, respectivamente, cuando se cultivan cerca de las granjas de peces, convirtiendo los residuos de la producción de peces en biomasa de bivalvos y macroalgas (Neori et al. 2004, Zhou et al. 2006)"

POTENCIAL EN ARGENTINA









POTENCIAL EN ARGENTINA

Diferentes asociaciones de productores de soja de EEUU vienen desarrollando proyectos de acuicultura desde la década del 80´, tanto en sistemas de cultivo continentales como en sistemas offshore marinos.

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GRACIAS POR PARTICIPAR

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