VETANCO

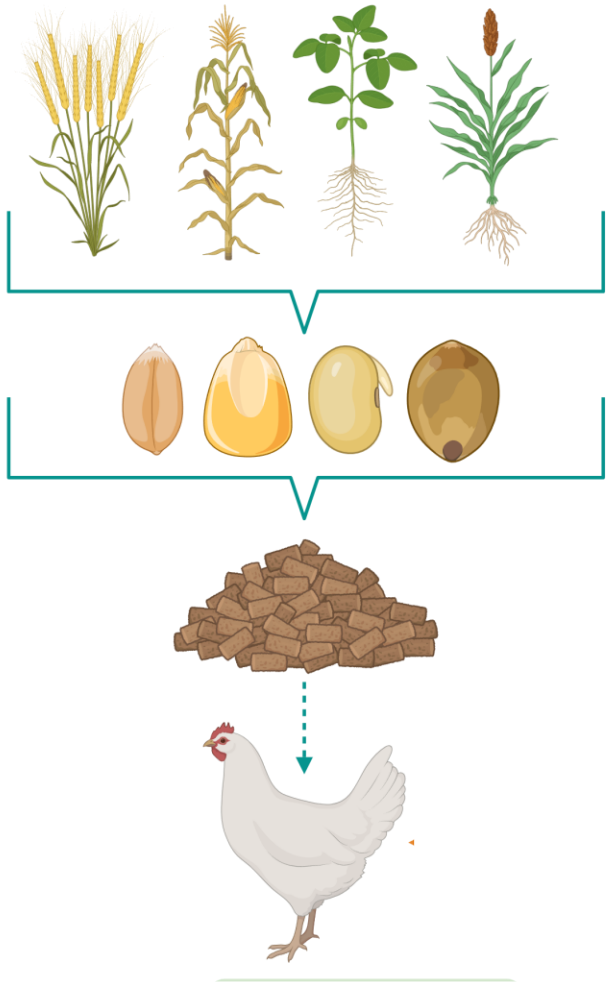
SALUD INTESTINAL *EL ÉXITO EN LA DIFERENCIACIÓN DE PRODUCCIÓN*

M.V. Esp. Bruno Vecchi

Gerente Técnico Avícola

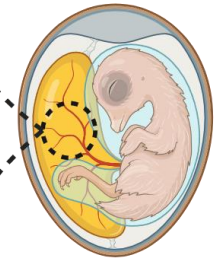
bvecchi@vetanco.com

Productos seguros,
para alimentos seguros.

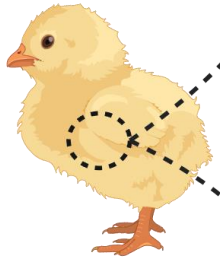


Porque las aves **no expresan** su máximo potencial genético?

Queda un remanente del 20% al nacimiento



Debe hacer un cambio metabolico de lipidos a hidratos de carbono



Representa el 90% de la energia necesaria, principalmente lipidica

Consume el 100% de las reservas energeticas para nacer

Review

Nutrition and Digestive Physiology of the Broiler Chick: State of the Art and Outlook

Velmurugu Ravindran * and M. Reza Abdollahi

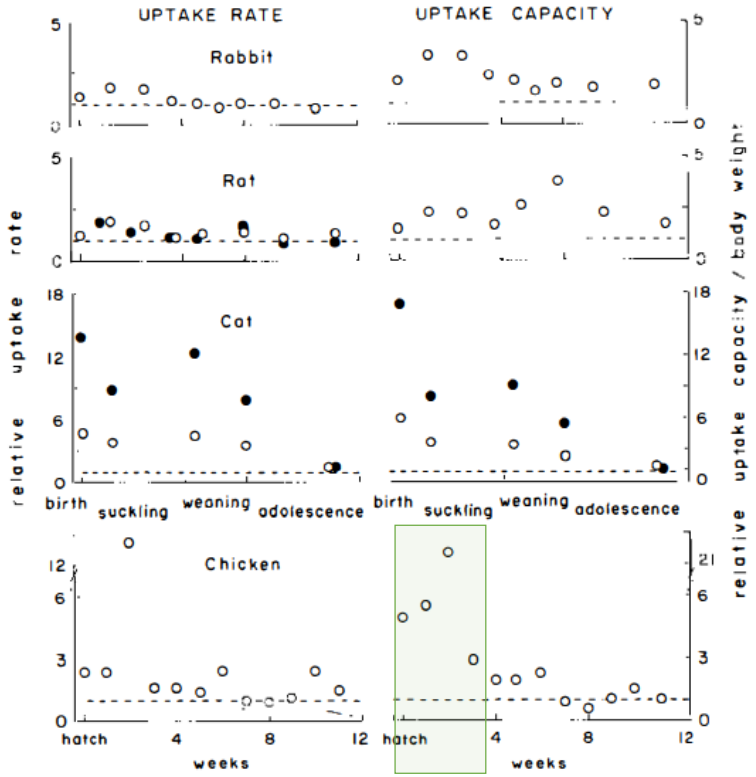


Figure 2 Intestinal brush-border aldohexose uptake in rabbit (14), rat (77), cat (15), and chicken (53) as a function of postpartum developmental stage. Values are relative to adult values (mammals) or 12-week values (chickens). *(left)* Uptake rates, measured at 50 mM by the everted-sleeve method, averaged over the length of the small intestine. *(right)* Corresponding uptake capacity of the whole length of the small intestine, divided by body weight. ○ = glucose, ● = galactose.

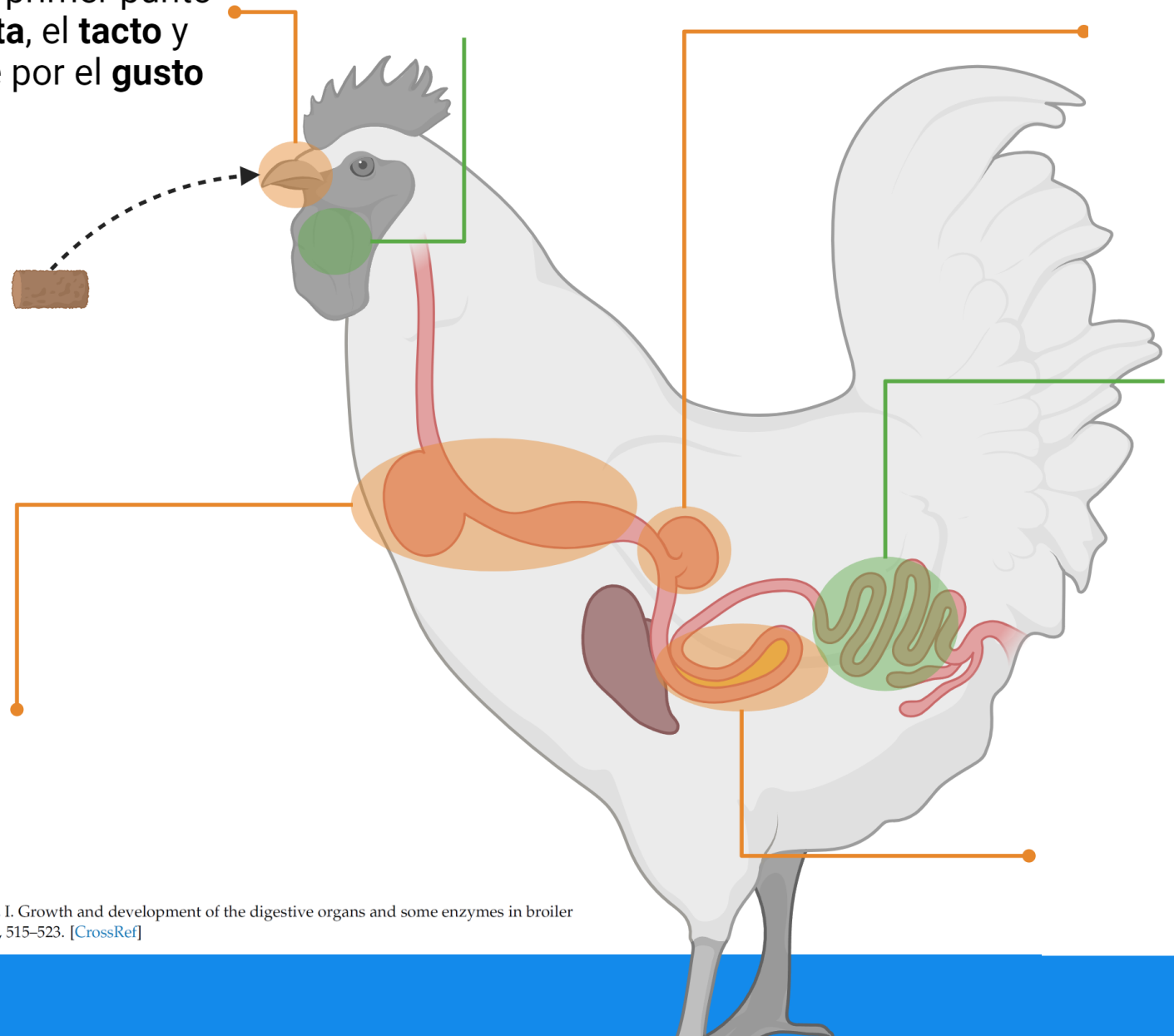
ONTOGENETIC DEVELOPMENT OF INTESTINAL NUTRIENT TRANSPORTERS

Randal K. Buddington[1] *and Jared M. Diamond*

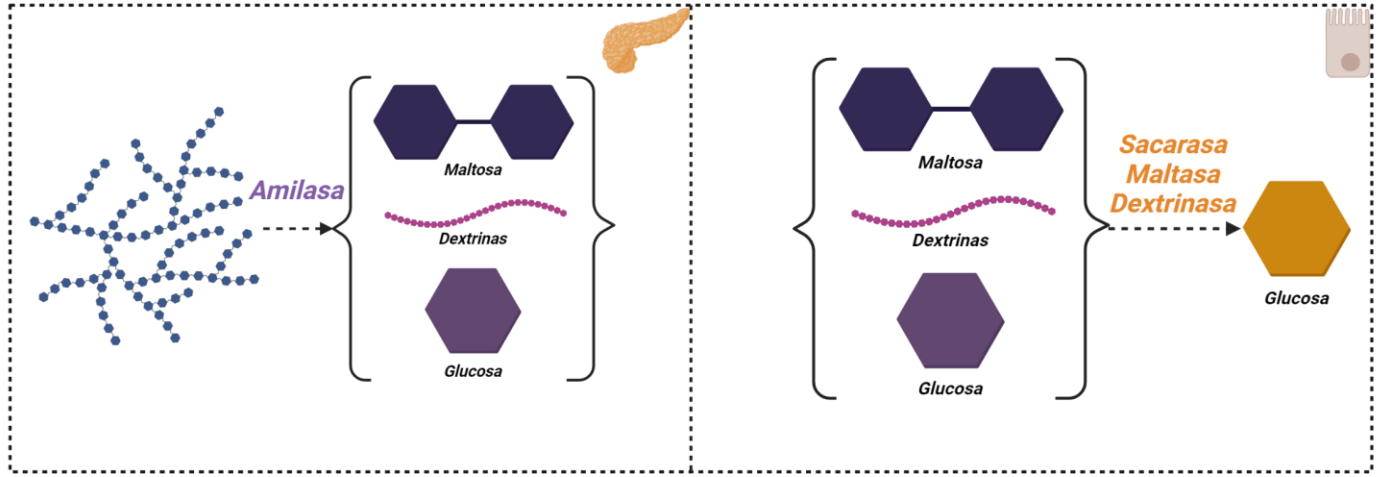
Physiology Department, University of California Medical School, Los Angeles, California 90024-1751

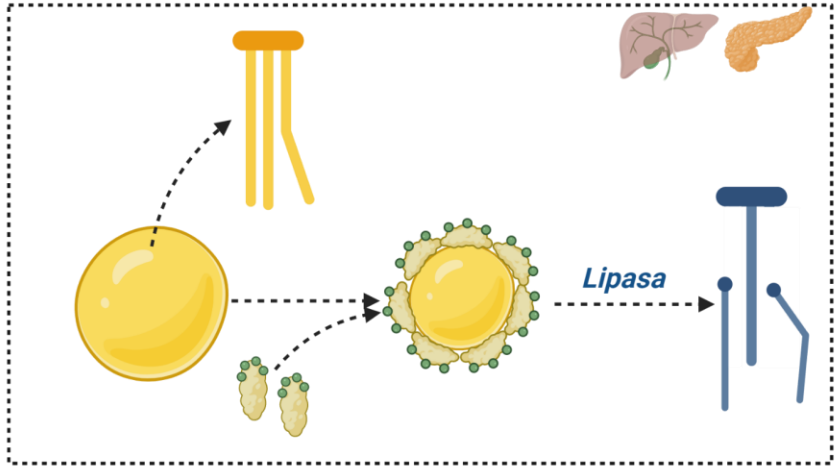
La capacidad de digesti
de **HdC** de los primero
días de vida
depende del
proceso de
incubación. Mientr
que la de **proteínas**
está sumamente
reducida hasta los
10 días de vida.

La seleccion del alimento se hace en primer punto por la **vista**, el **tacto** y finalmente por el **gusto**



Nitsan, Z.; Ben-Avraham, G.; Zoref, Z.; Nir, I. Growth and development of the digestive organs and some enzymes in broiler chicks after hatching. *Br. Poult. Sci.* **1991**, *32*, 515–523. [CrossRef]





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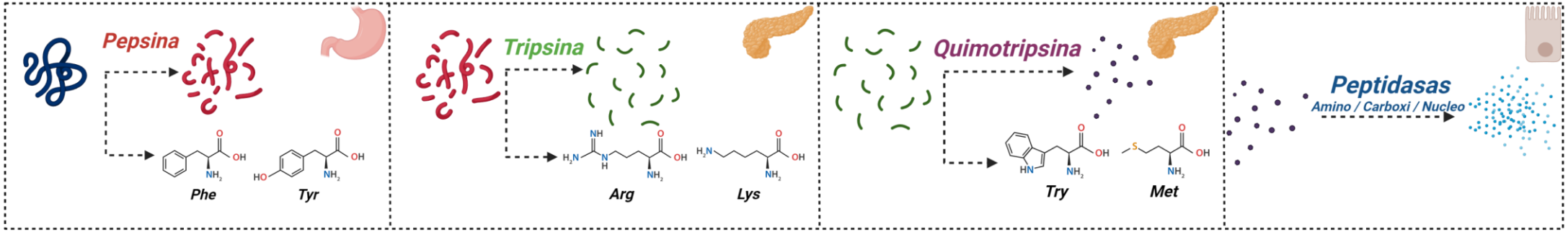
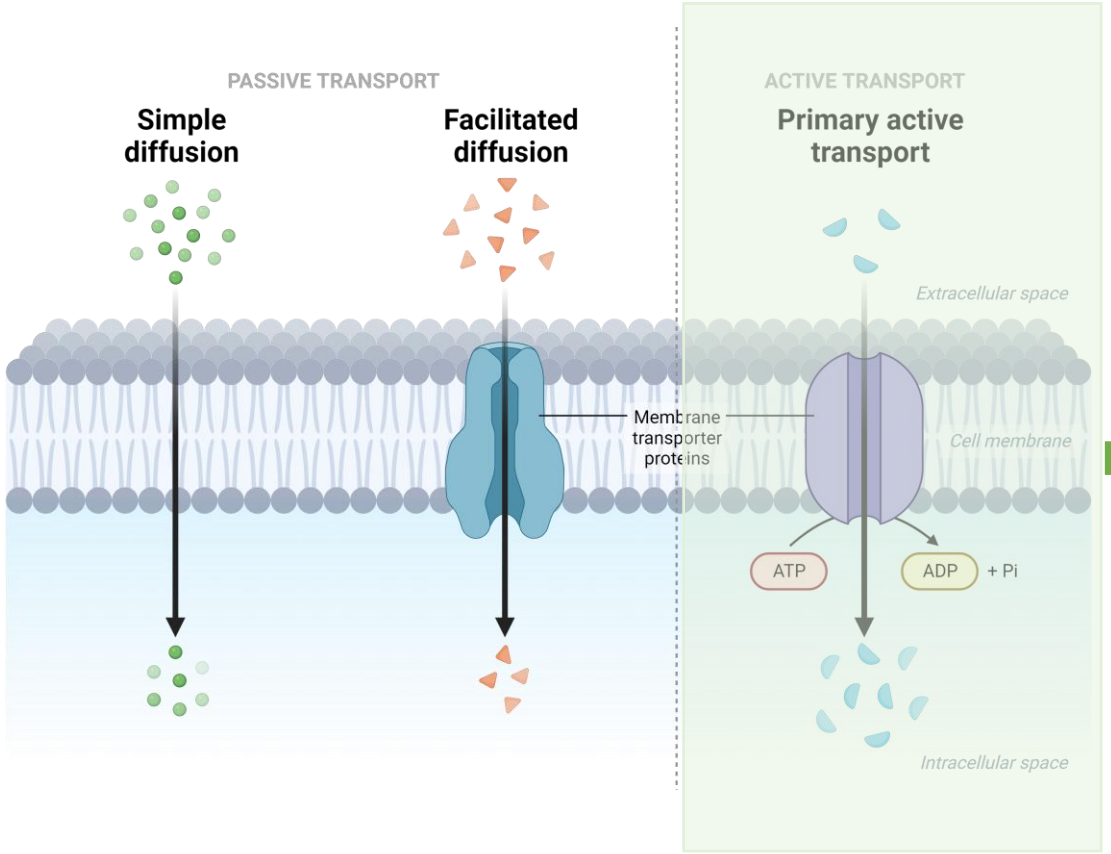




Digestion and Absorption of Carbohydrates in Fowl and Events through Perinatal Development

Article *in* Journal of Nutrition · June 1985
DOI: 10.1093/jn/115.5.665 · Source: PubMed

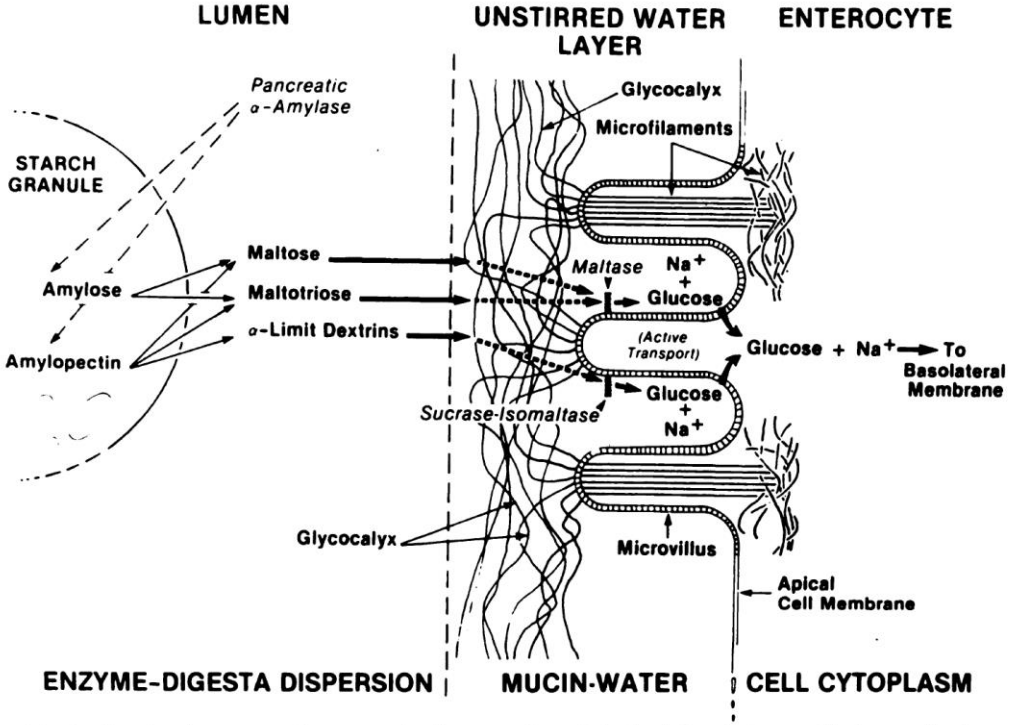
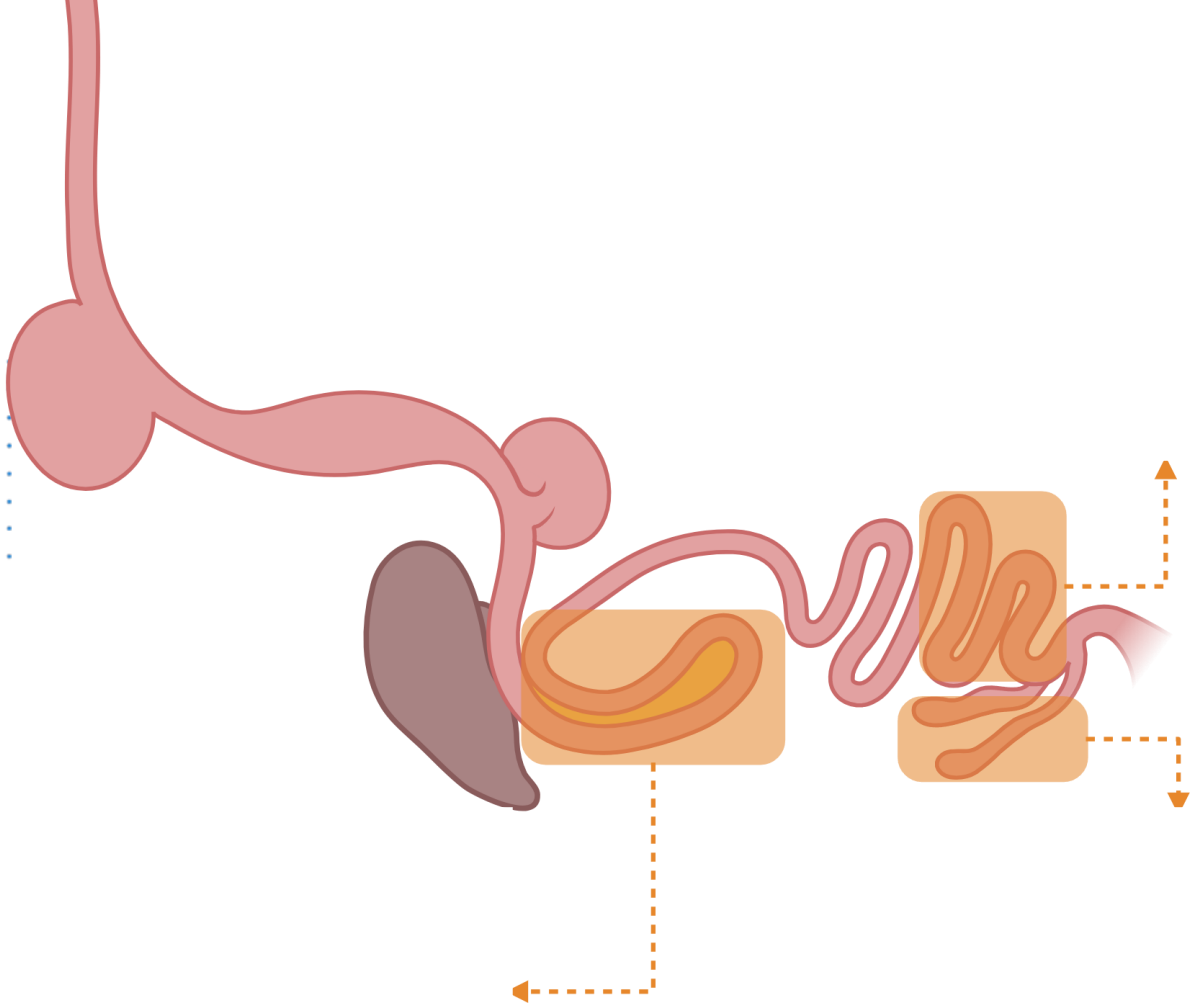


Fig. 1 Postulated sequence of events in the digestion of starch by fowl. Starch is normally in granular form and pancreatic α-amylase progressively hydrolyzes constituent amylose and amylopectin to maltose, maltotriose and α-limit dextrins. Enterocytes lining the small intestine project microvilli and a fibrous glycocalyx into the lumen. An aqueous dispersion of mucin from nearby goblet cells is immobilized in these structures to form the "unstirred water layer." Dissolved products from starch digestion must diffuse through this barrier to reach carbohydrases anchored on the surface in order to finalize digestion; however, glucose accrues near active transport sites, and its rate of absorption is improved.

Murakami, H.; Akiba, Y.; Horiguchi, M. Growth and utilization of nutrients in newly hatched chick with or without removal of residual yolk. *Growth Dev. Ageing* **1992**, *56*, 75–84.

Tancharoenrat, P.; Ravindran, V.; Zaefarian, F.; Ravindran, G. Apparent metabolisable energy and total tract fat digestibility of different fat sources for broiler chickens. *Anim. Feed Sci. Technol.* **2013**, *186*, 186–192. [CrossRef]



Review

Composition and Function of Chicken Gut Microbiota

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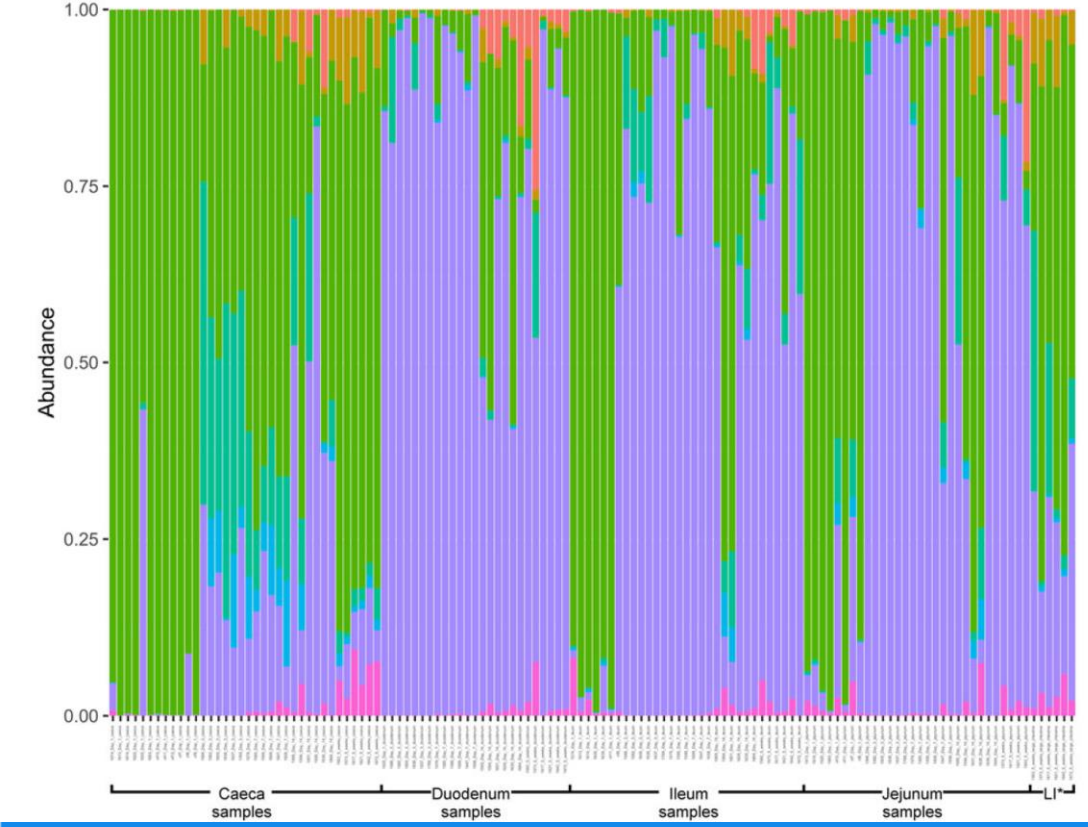
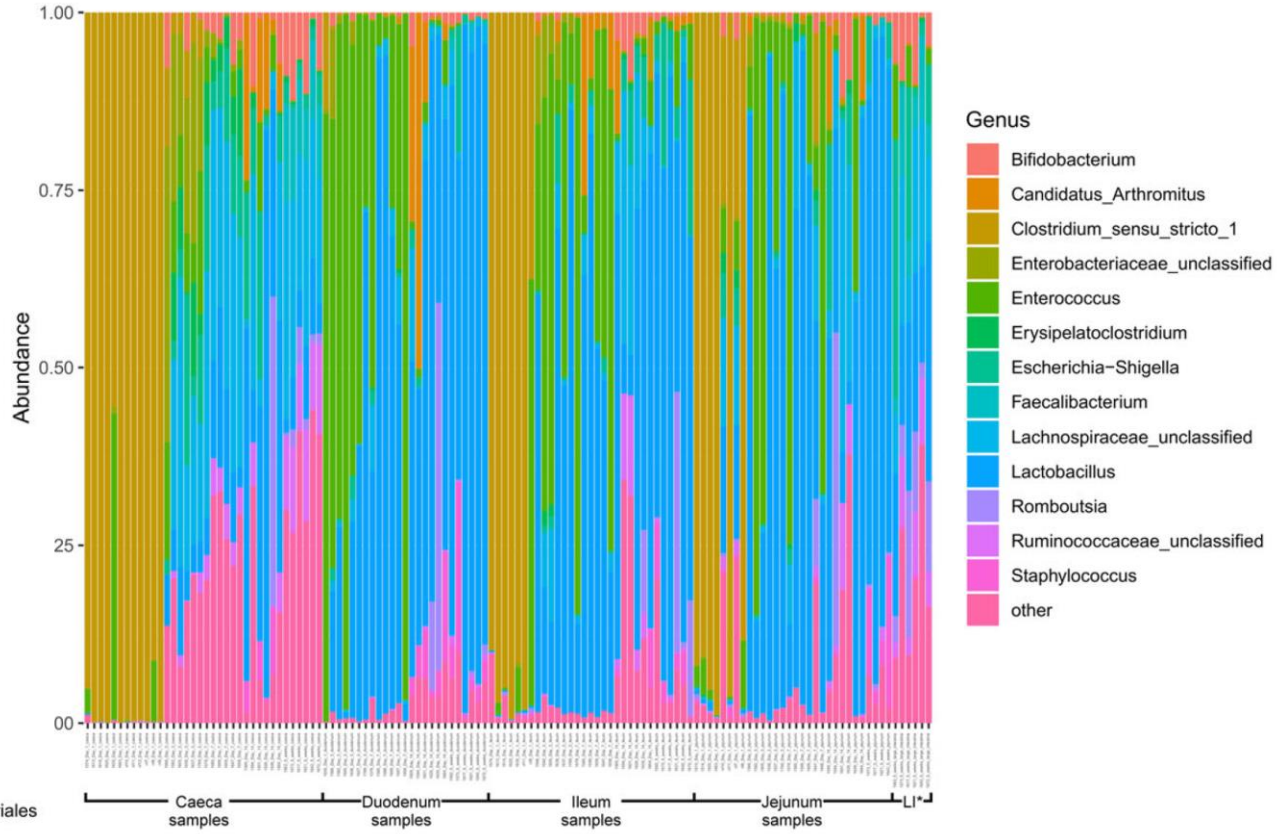
RESEARCH ARTICLE Open Access

Development of the duodenal, ileal, jejunal and caecal microbiota in chickens

Laura Glendinning*, Kellie A. Watson and Mick Watson





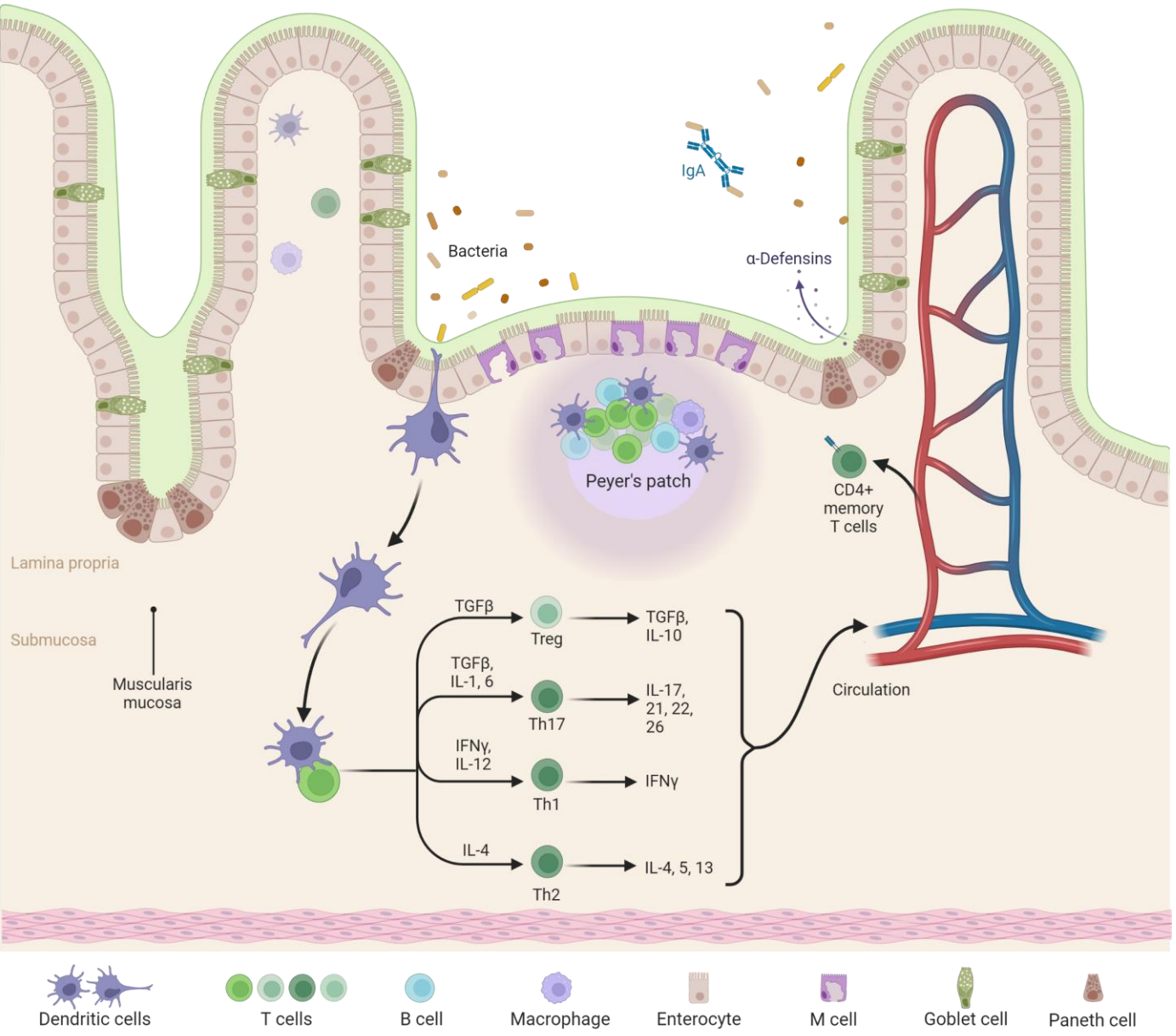
Hay más bacterias que células en todo el organismo

300,000 genes microbianos

vs.

23,000 genes humanos

Intestinal Immune System



Al **carecer de linfonodulos**, todo el proceso de reconocimiento, activación y capacitación inmune debe darse en la mucosa intestinal.

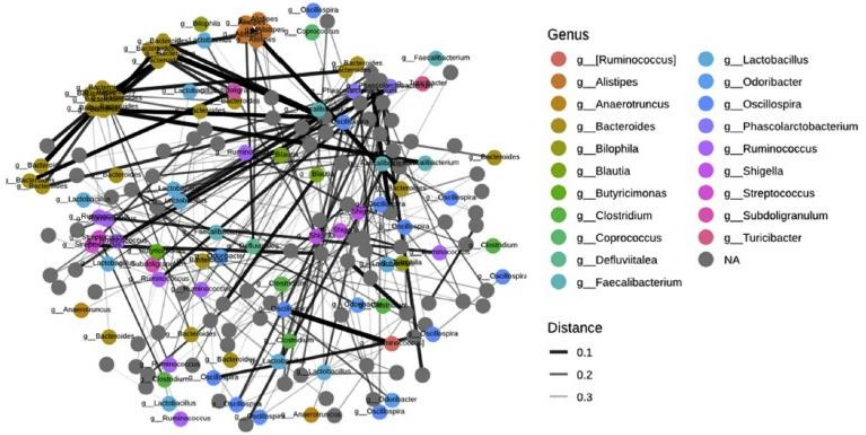
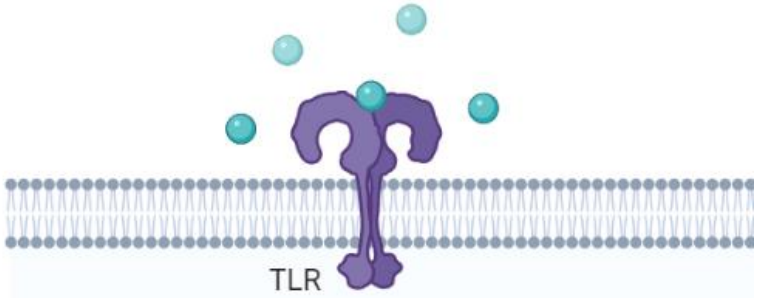
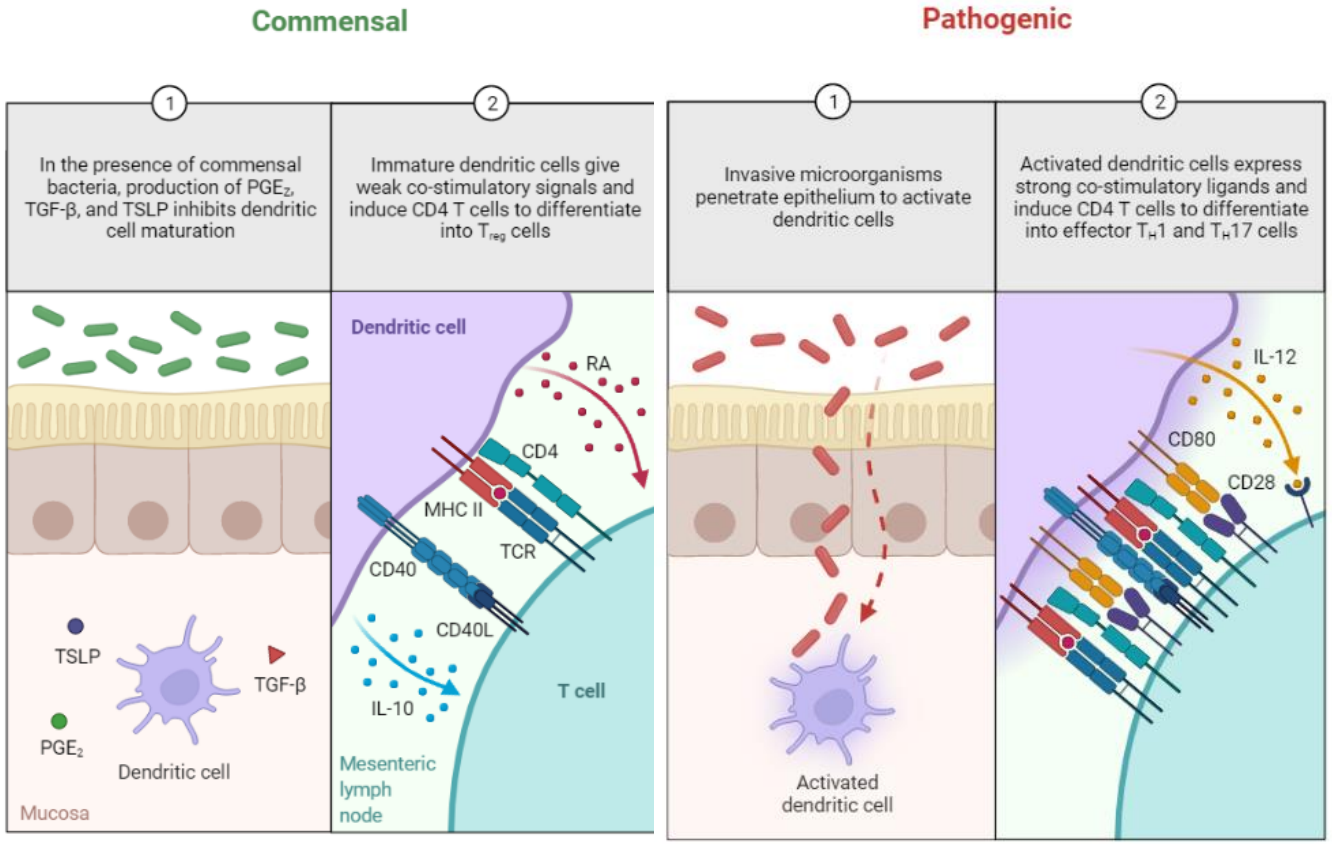


Figure 4. Total relationship between genera found in the cecum of broilers.

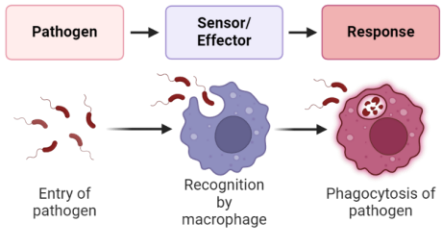
Y es aquí donde el **“dialogo”** entre el microbioma y el intestino *cobra más relevancia*

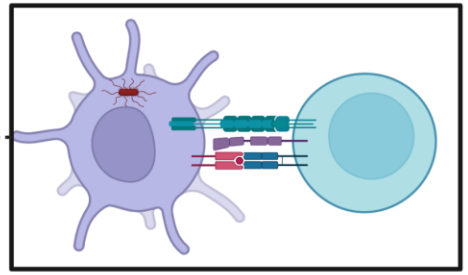


El ave posee 10 tipos distintos de **TLRs**

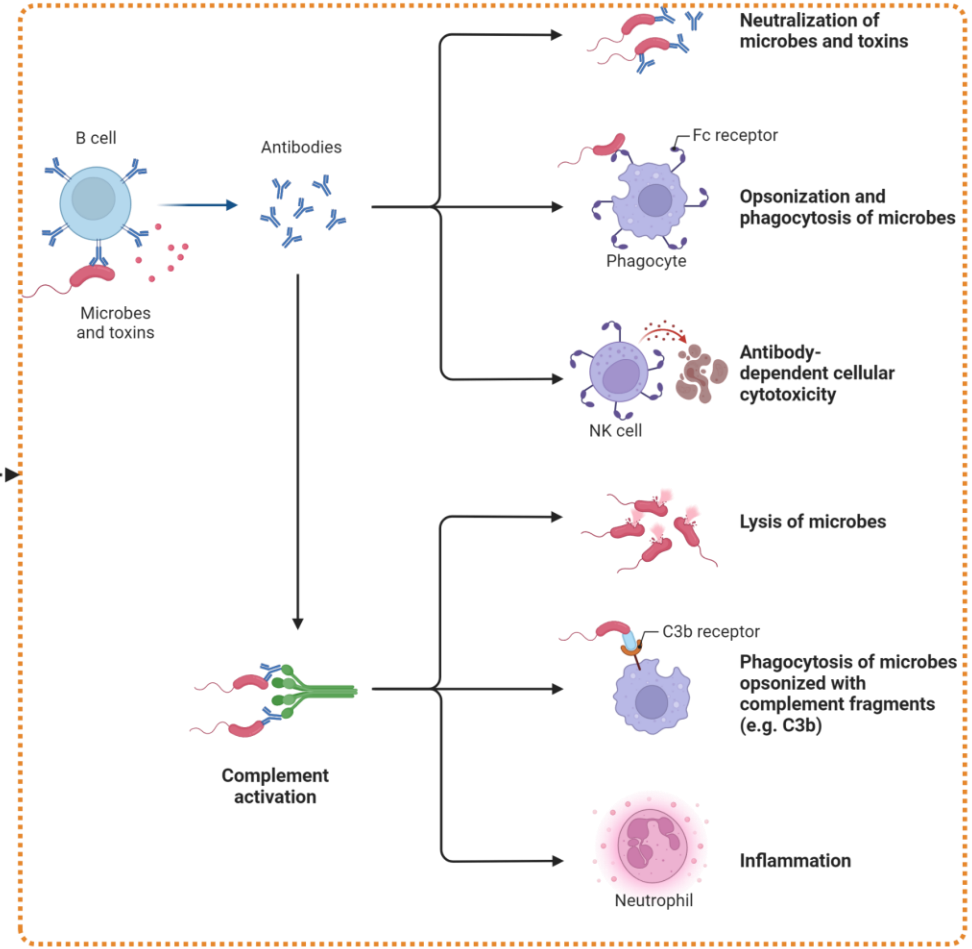


General Principles of the Innate Immune Response



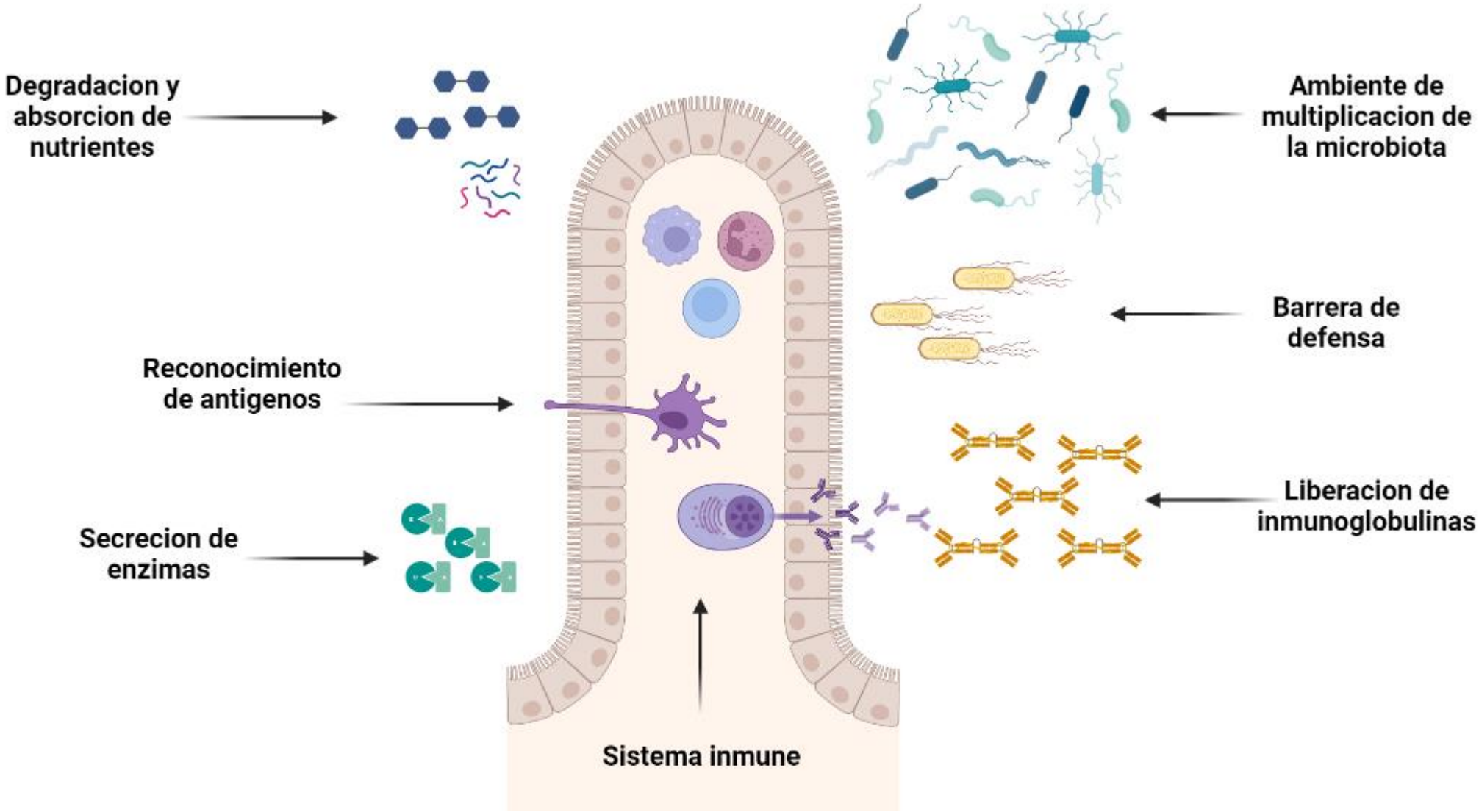


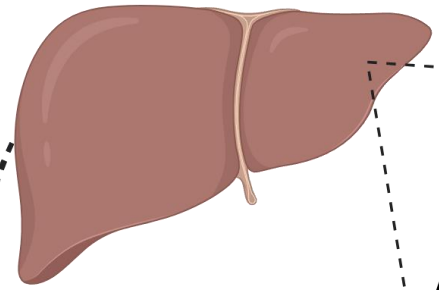
Lymphocyte subsets	2nd order cytokines	Effector cells	Response
T_{fh}	IL-21	B cell	Antibodies
T_H2	IL-4 IL-5 IL-13	Basophil, Eosinophil, Epithelia	• Worm expulsion • Mucus production
T_H1	IFN-γ	Macrophage, Neutrophil, Epithelia	• Chemokines • Antimicrobial peptides • Lysis of virus infected cells • Phagocytosis and lysis of bacteria
T_H17	IL-17	Fibroblast, Epithelia	• Chemokines • Neutrophil • Phagocytosis of extracellular bacteria and fungi
iTreg	IL-10 TGFβ	Dendritic cell, CD4 T cell	Suppression of T cell responses



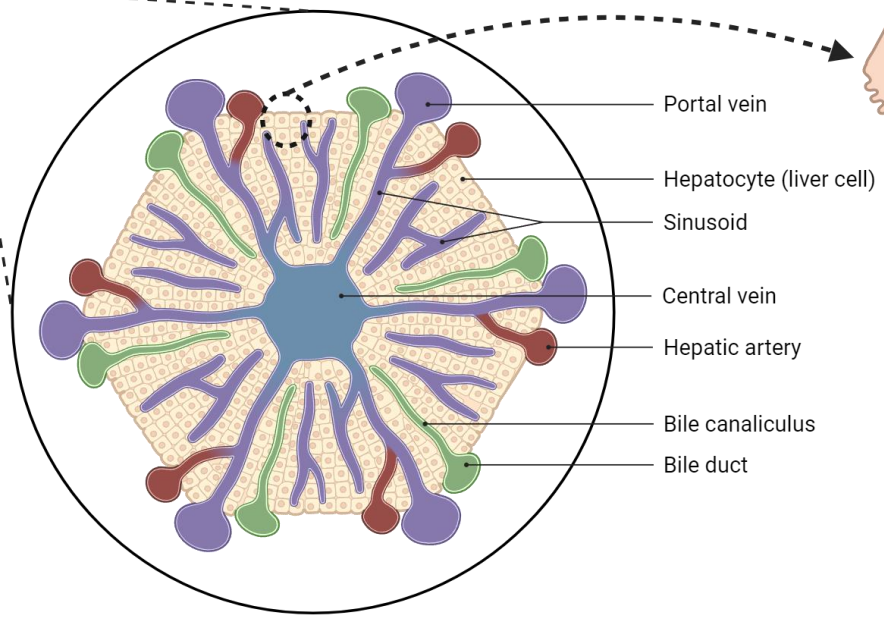
Un órgano, mil funciones…

El intestino tiene varias funciones vitales que van mas allá de la absorción de nutrientes

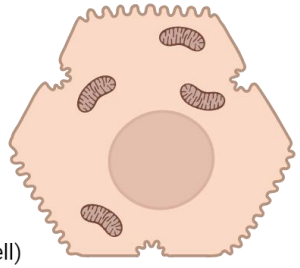




Hepatic (liver) lobule



Posee 100.000 lobulos



Representan el 80% de la estructura del higado

Review

Avian Liver: The Forgotten Organ

Faegheh Zaefarian [1,*], Mohammad Reza Abdollahi [1], Aaron Cowieson [2] and Velmurugu Ravindran [1]

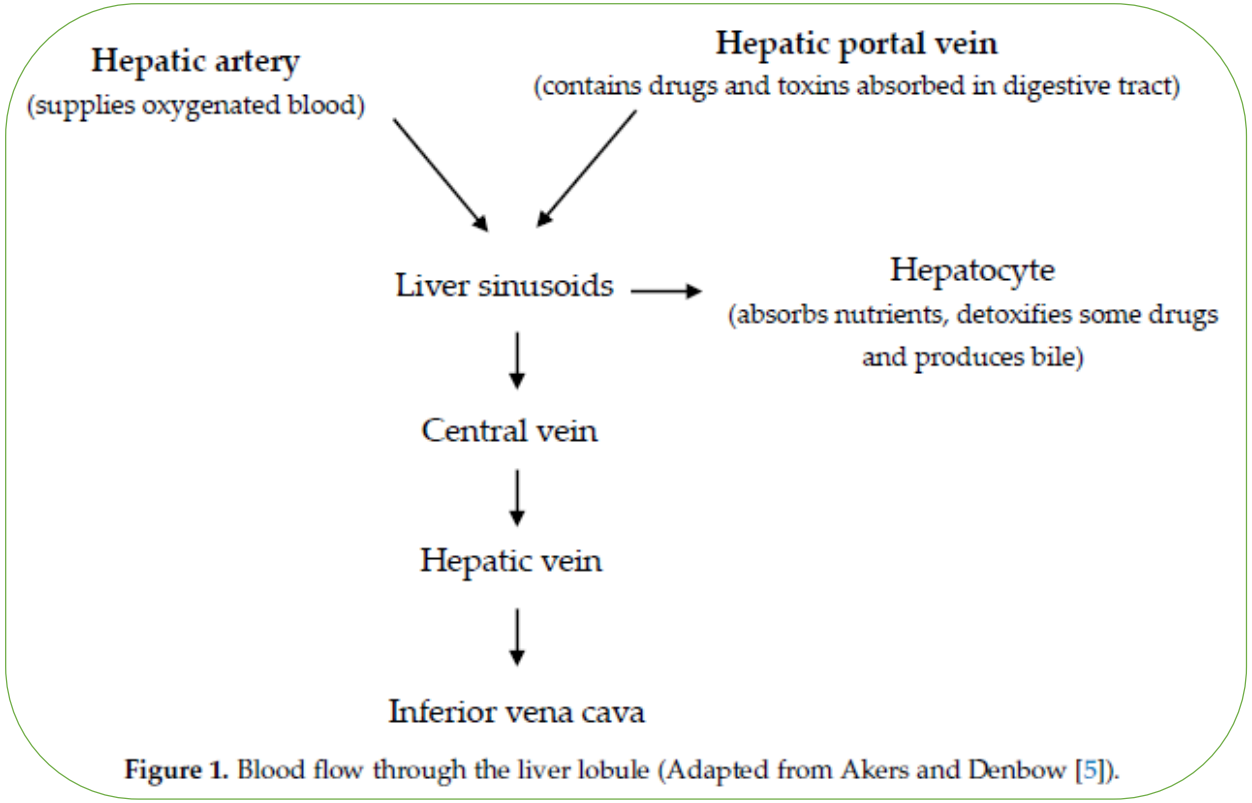
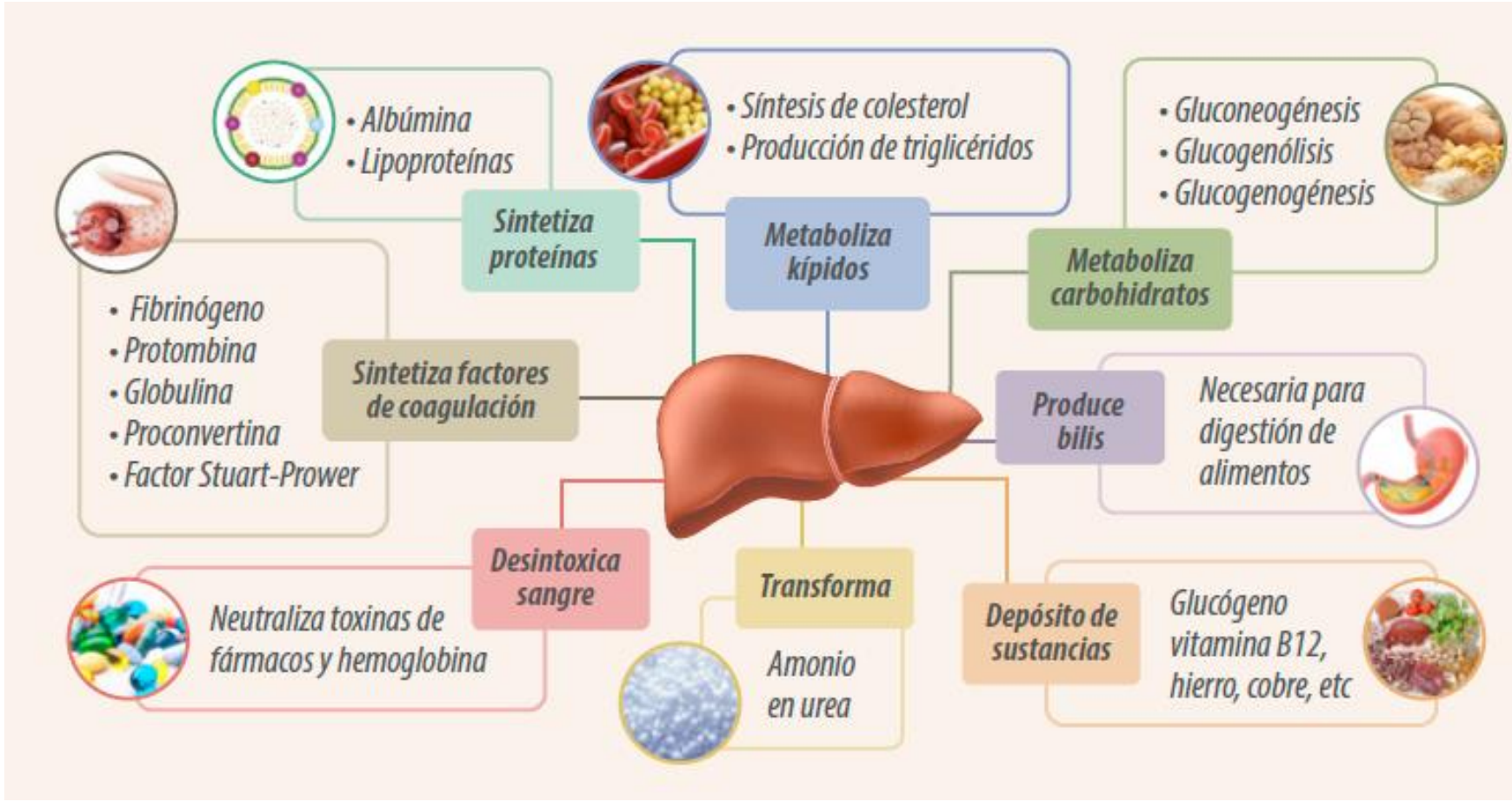


Figure 1. Blood flow through the liver lobule (Adapted from Akers and Denbow [5]).

Recordemos que el 100% de los lípidos y los péptidos/aminoácidos pasan **primero por el hígado** antes de ser distribuidos al resto del organismo.

Y el hígado?? Que rol cumple?

Hígado sano



Juanita Sorza Restrepo.
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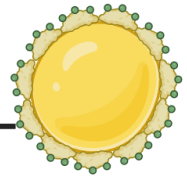
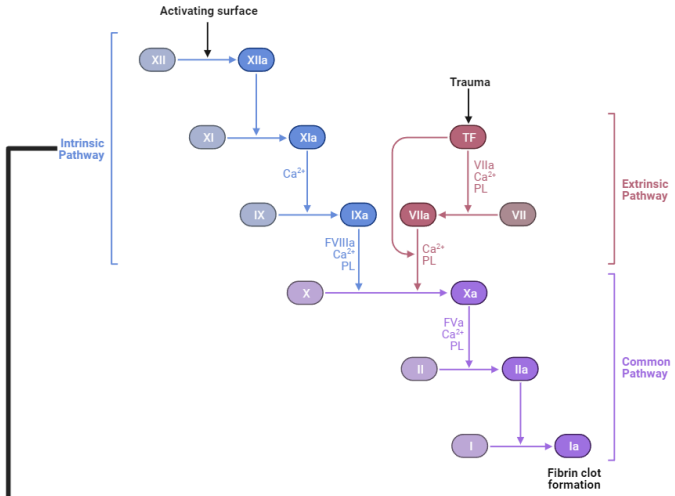
Ácidos Biliares



- Son de **sintesis hepatica**
- Levemente **ácidos**
- **Baja produccion** durante las primeras semanas de vida.

Factores de coagulacion



Sintesis de **todos los factores de coagulacion** y sus inhibidores

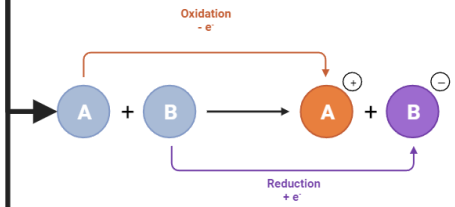
Vitaminas

- Las **liposolubles** se almacenan en el higado
- Participa del metabolismo de la **vitamina D**

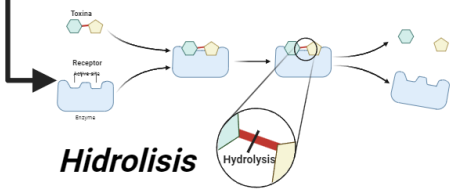
Detoxificacion

Detoxification Pathways in the Liver

D. M. Grant
Division of Clinical Pharmacology and Toxicology, Research Institute, Hospital for Sick Children, 555 University Avenue, Toronto, Ontario M5G 1X8, Canada



Oxido-reduccion



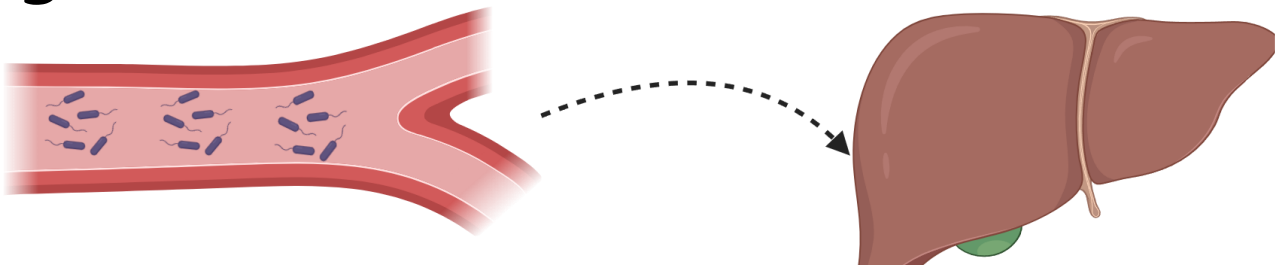
Hidrolisis

Conjugacion

Table 1 Enzymes of xenobiotic biotransformation

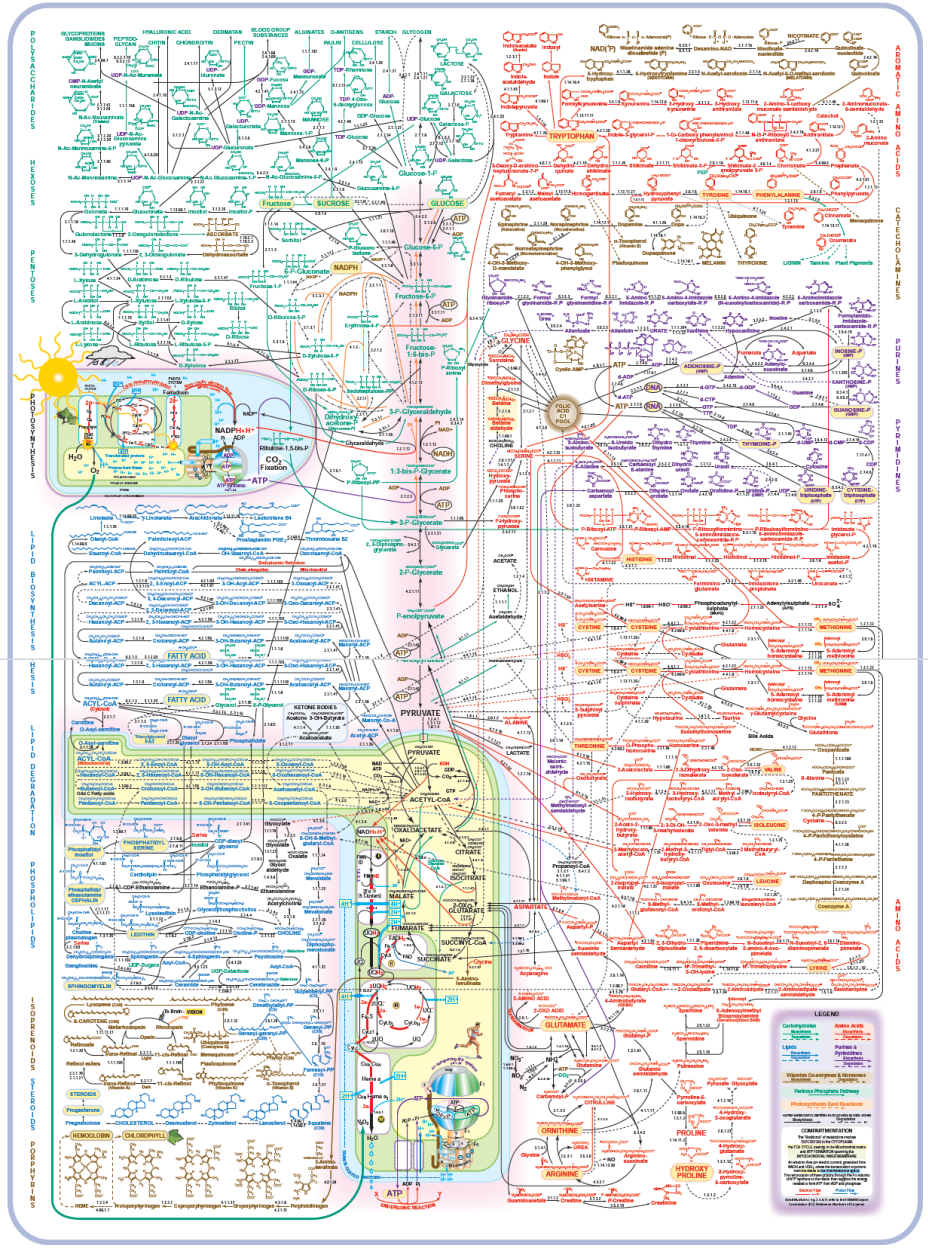
Phase I	*Phase II*
Dehydrogenases	Conjugation reactions
Alcohol dehydrogenase	UDP-glucuronyltransferase
Aldehyde dehydrogenase	Alcohol sulphotransferase
Dihydrodiol dehydrogenase	Amine O-sulphotransferase
Xanthine dehydrogenase	Phenol sulphotransferase
Reductases	Glutathione transferase
Ketoreductase	Phenol O-methyltransferase
Nitroreductase	Catechol O-methyltransferase
Azoreductase	Amine N-methyltransferase
N-oxide reductase	Histamine N-methyltransferase
Sulphoxide reductase	Thiol S-methyltransferase
Oxidases	Glycine acyltransferase
Aldehyde oxidase	Glutamate acyltransferase
Monoamine oxidase	Arylamine N-acetyltransferase
Mono-oxygenases	Cysteine N-acetyltransferase
Cytochromes P450	Cysteine conjugate β-lyase
Flavin-containing mono-oxygenase	Thioltransferase
Hydrolases	Rhodanese
Esterases and amidases	
Epoxide hydrolase	

Un órgano inmune?



Todas estas funciones metabólicas son importantes e irremplazables

En una situación de **crecimiento** el hígado posee una **elevada tasa metabólica** para poder mantener la elevada demanda de incremento de masa muscular al mismo tiempo que terminan de desarrollarse el resto de los órganos.



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PERO QUE SUCEDE CUANDO LAS AVES SE ENFRENTAN A SITUACIONES DE ESTRES

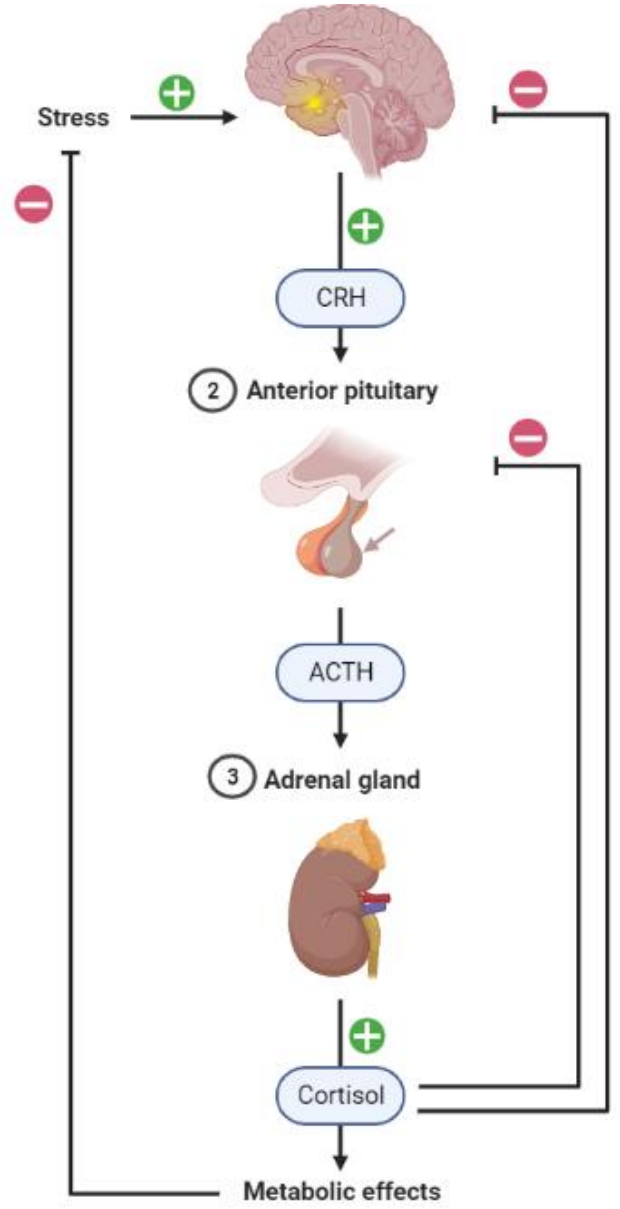
Table 1. Stressors and plasma concentrations of corticosterone in chickens.

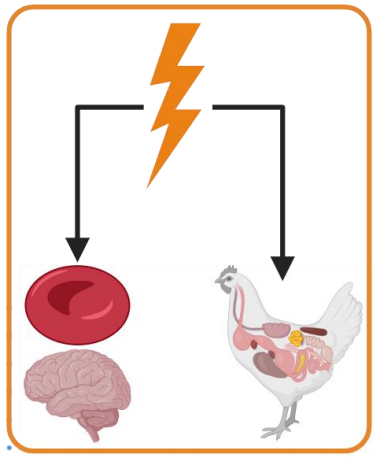
	Effect	Reference
Biological/production stressors		
Cold	↑↑	Beuving and Vonder, 1978
Heat	↑↑	Beuving and Vonder, 1978
Acute heat stress	→	Xie et al., 2015
Diethyl ether	↑↑	Scanes et al., 1980
Stocking density	↑	Mirfendereski and Jahanian, 2015
E. coli endotoxin	↑↑	Curtis et al., 1980; Scanes et al., 1980
Cooping stress	↑↑	Satterlee et al., 1994
Immobilization	↑↑	Beuving and Vonder, 1978; Kang and Kuenzel, 2014
Restraint	↑↑	Fallahsharoudi et al., 2015
Handling	↑↑	Kannan et al., 1997a
Shackling	↑↑	Kannan et al., 1997a; Bedánová et al., 2007; Huang et al., 2014
Crating alone or with transportation	→	Kannan et al., 1997b; Zhang et al., 2009
Transportation	↑	Al-Aqil et al., 2013
Transportation	↓	Vosmerova et al., 2010
Ammonia	→	Olanrewaju et al., 2008
Nutritional/metabolic stressors		
Fasting	↑↑	Harvey et al., 1983
Insulin induced hypoglycemia	↑↑	Scanes et al., 1980
Chronic feed restriction	↑↑	de Jong et al., 2002; Najafi et al., 2015; Pál et al., 2015
Skip a day feeding regimen	↑↑	de Beer et al., 2008
Protein deprivation	↑↑	Carsia et al., 1988
Molting	↑↑	Davis et al., 2000
Early in forced molt	↓	Gildersleeve et al., 1982
Fish oil addition to feed	↓	Pál et al., 2015
Re-feeding following fasting	↓↓	Harvey et al., 1983
Overnight feed withdrawal	↓	Kannan et al., 1997a,b
Lighting		
Light source	↑	Huth and Archer, 2015
Light intensity	→	Olanrewaju et al., 2014

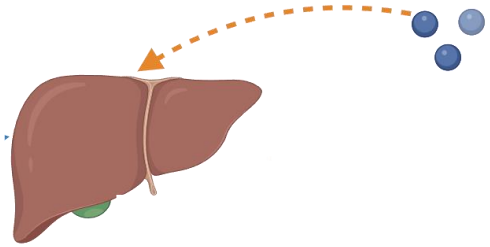
Biology of stress in poultry with emphasis on glucocorticoids and the heterophil to lymphocyte ratio

Colin G. Scanes[1]

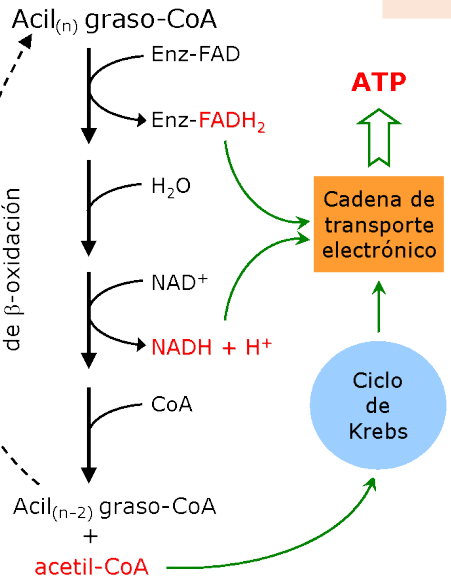
Department of Biological Sciences, University of Wisconsin Milwaukee, Milwaukee, WI 53211 USA

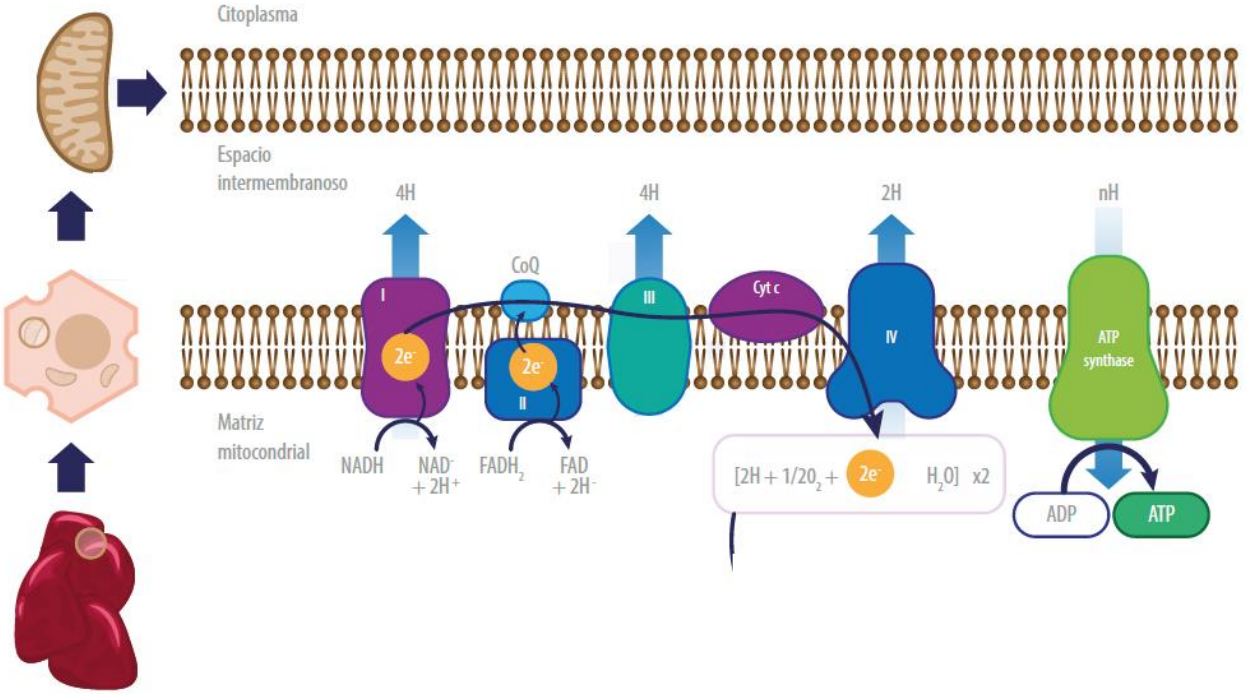






Corticoides



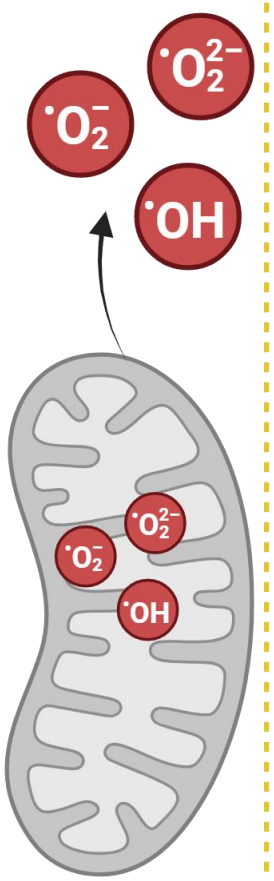


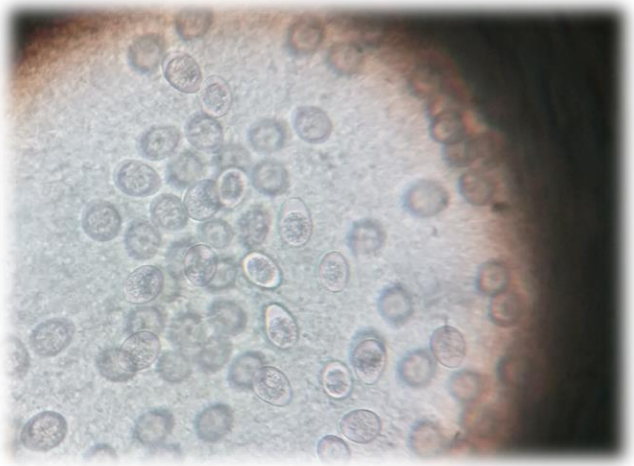
Pero **cuando la cadena incrementa su velocidad**, debido al aumento de la demanda metabólica algunas moléculas de oxígeno no logran reducirse de forma completa.

Como resultado, se producen moléculas que todavía tienen capacidad oxidativa llamadas **radicales libres**. Estas moléculas difunden dentro de la célula y **reaccionan con otros componentes, oxidándolos**.

Como el **estrés oxidativo se debe a un incremento metabólico**, los tejidos que tengan una mayor tasa metabólica son los primeros y más afectados por este fenómeno.

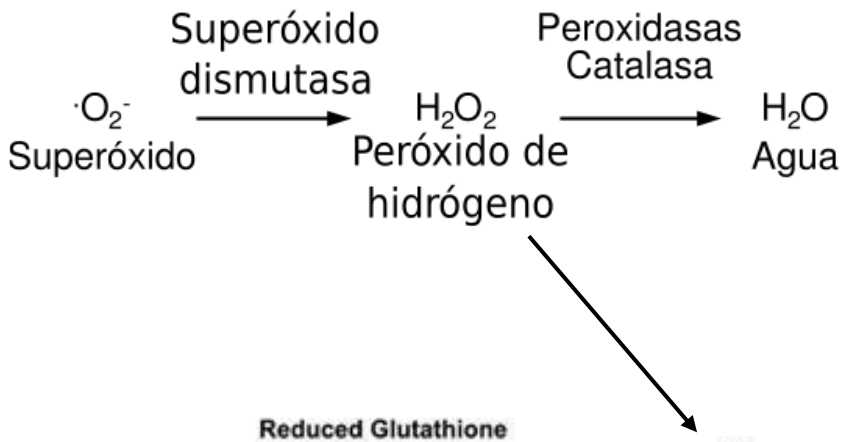
El **hígado, riñón, intestino, cerebro y espermatozoides**, son los más perjudicados por el estrés oxidativo (*Miguez MP et al., 1994 / Miller AL, 1996*).

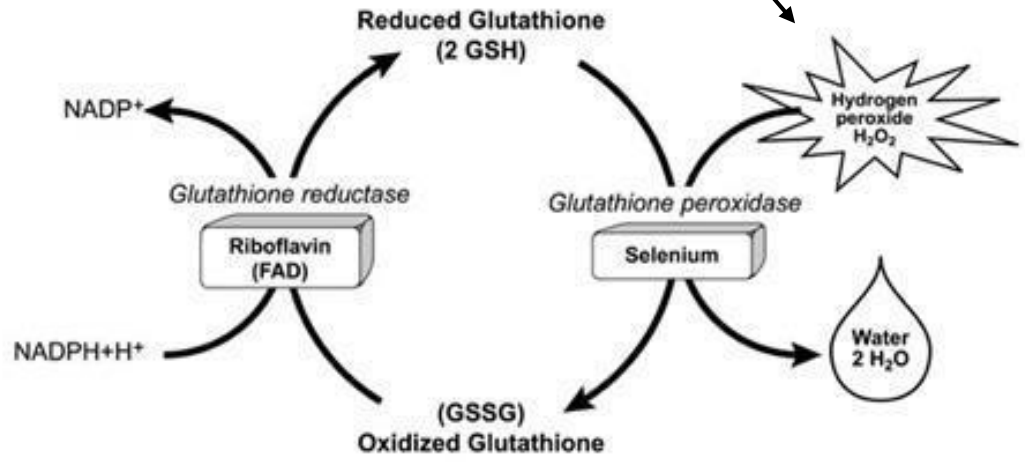

$^{\bullet}O_2^{2-}$
$^{\bullet}O_2^{-}$
$^{\bullet}OH$
$^{\bullet}O_2^{2-}$
$^{\bullet}O_2^{-}$
$^{\bullet}OH$

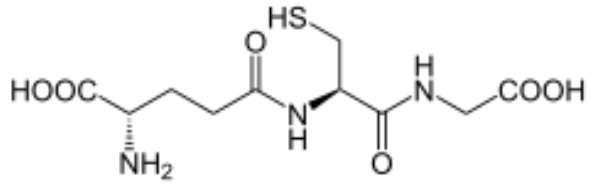


COMO PODEMOS HACER PARA **EVITAR Y DISMINUIR** EL DAÑO HEPATICO POR ESTRÉS?

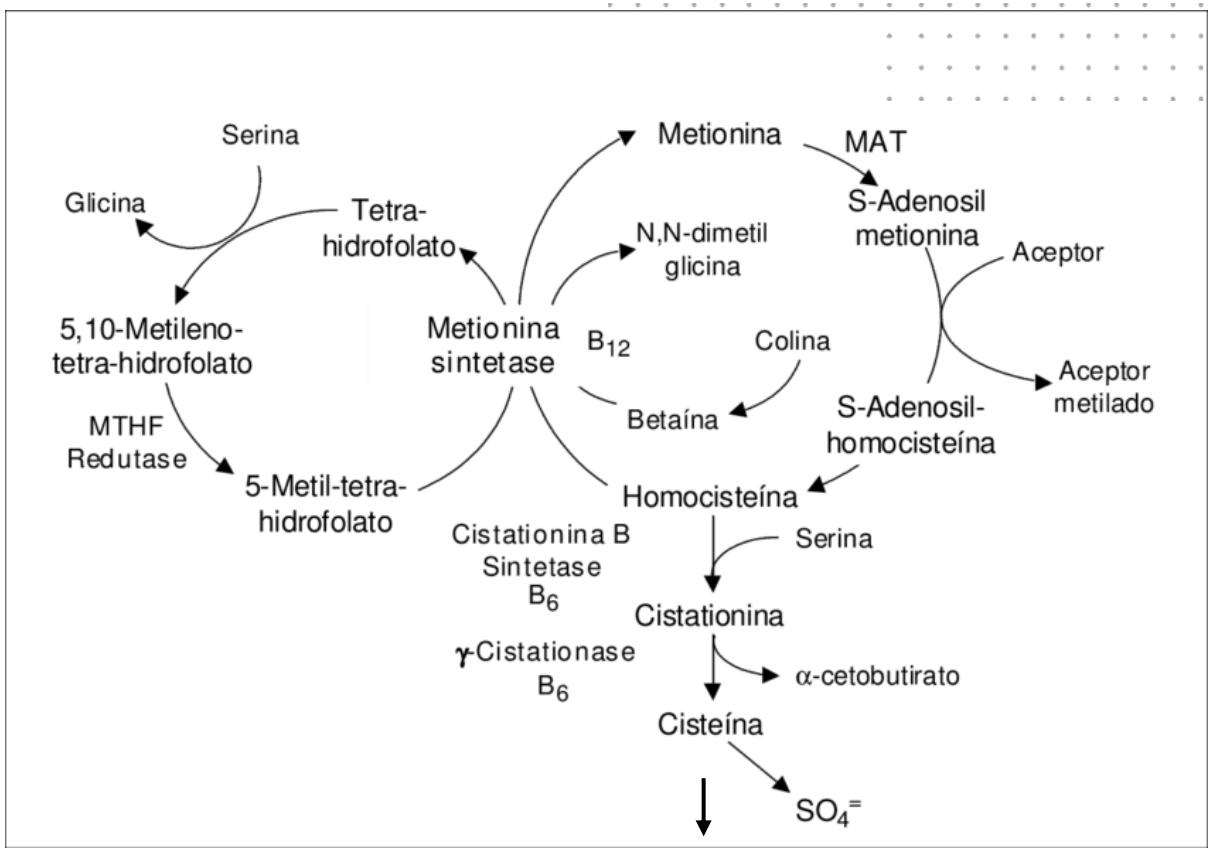
PROTECTORES ENDÓGENOS

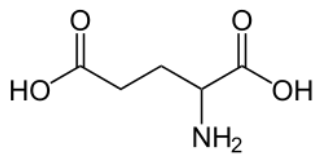




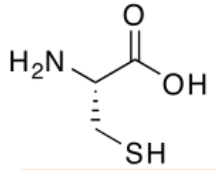


Glutatión

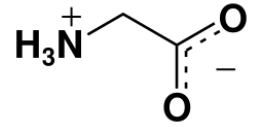




Glutamato



Cisteína



Glicina

No todos los hepatoprotectores **actúan de igual forma** o deben **ser utilizados para todos los problemas hepáticos** por igual.

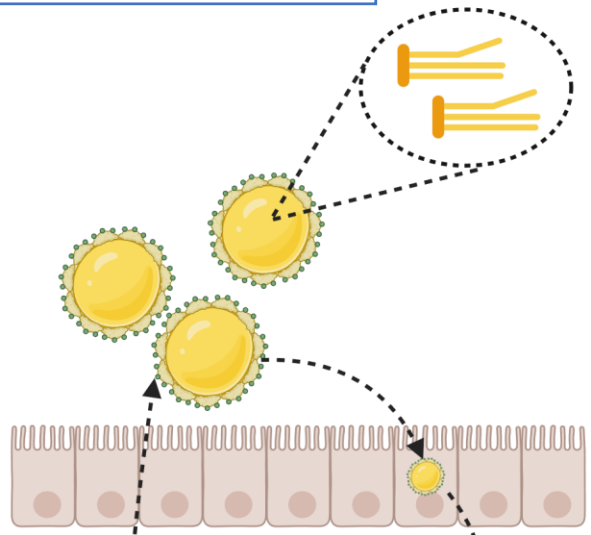
MEJORA DE LA DIGESTIBILIDAD Y METABOLISMO HEPÁTICO

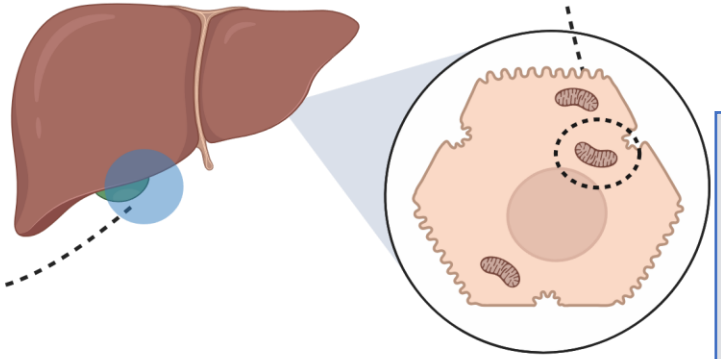
DISMINUCIÓN DEL DAÑO CELULAR

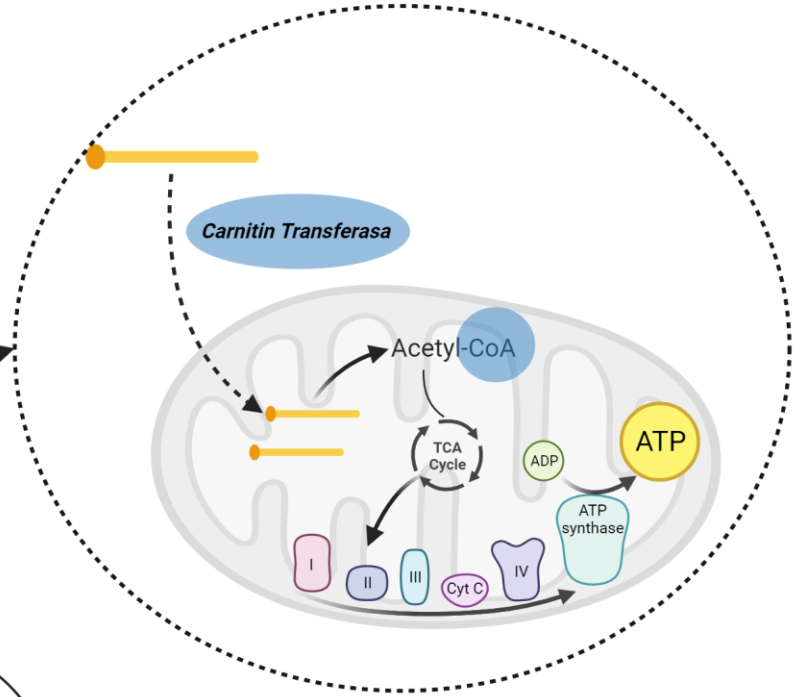
PROTECCIÓN Y REGENERACIÓN HEPATOCELULAR

MEJORA DE LA DIGESTIBILIDAD Y METABOLISMO HEPÁTICO

DISMINUYEN EL TRABAJO** QUE DEBE REALIZAR EL HIGADO, FACILITANDO ALGUNAS DE SUS TAREAS, **PRINCIPALMENTE LAS DIGESTIVAS.



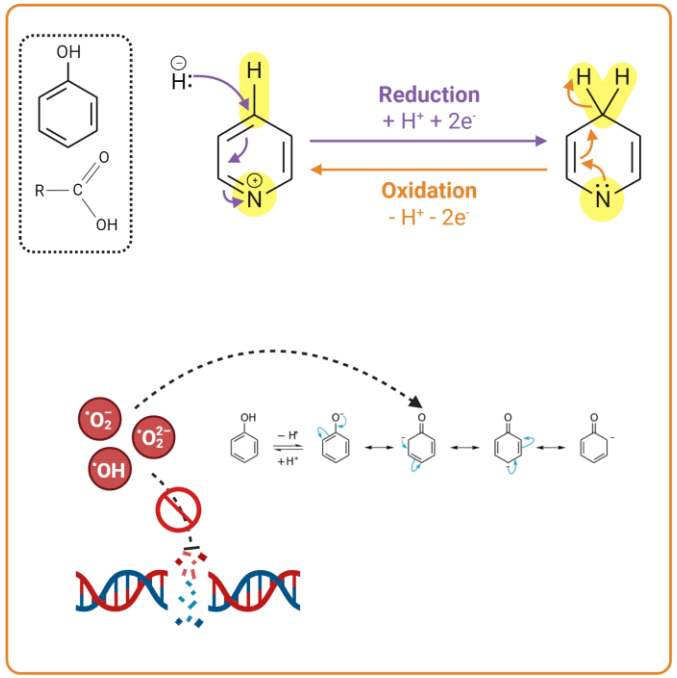




COLERETICOS y COLAGOGOS
Estimulan la generación de bilis y el vaciado de la vesícula biliar. Favorecen a la digestión del alimento

MEJORADORES DEL METABOLISMO DE LIPIDOS (CARNITINA, COLINA)
Favorecen la movilización y metabolismo de los ácidos grasos y lípidos. Evitando así, su excesiva concentración en el hígado.

ELIMINAN LOS AGENTES DAÑINOS *DEL INTERIOR DE LA CELULA, PRINCIPALMENTE LOS* ***RADICALES LIBRES.***

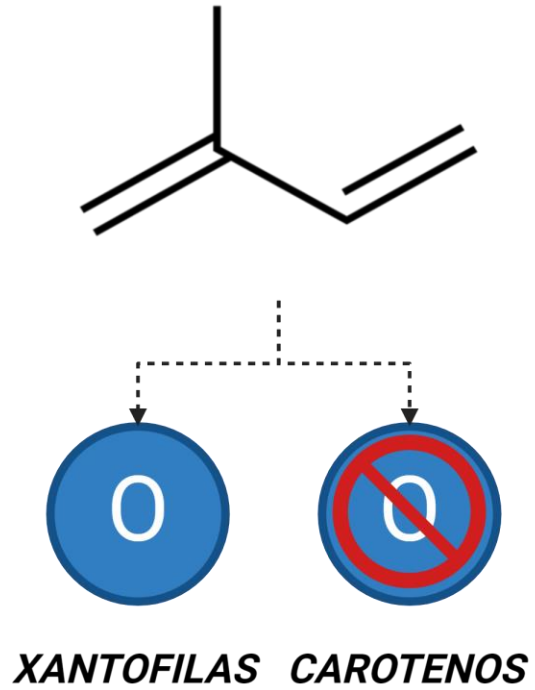


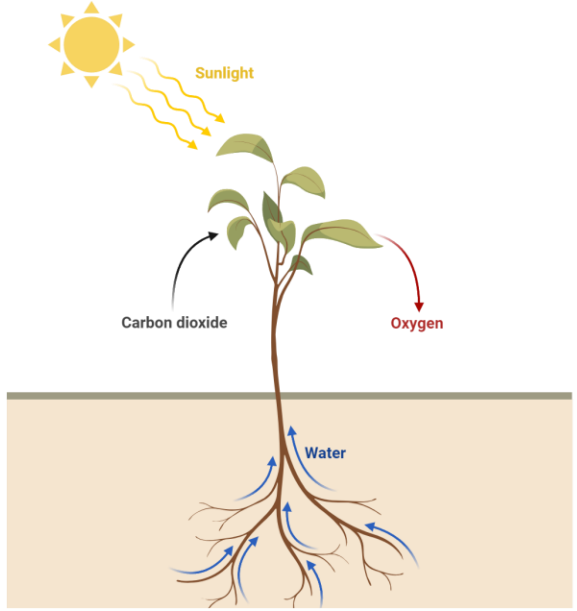
ANTIOXIDANT CLASSIFICATION

- **Synthetic**
  - **Nano-antioxidants**
    - Oxides
    - Metallic nanoparticles
    - Antioxidant-functionalized nanoparticles
  - **Phenolic structures**
    - BHA
    - BHT
    - TBHQ
- **Natural**
  - **Endogenous**
    - **Nonenzymatic**
      - **Low molecular weight**
        - **Lipophilic**
          - Lipoic acid
          - Ubiquinol
          - Ubiquinone
          - Plasmalogen
        - **Hydrophilic**
          - Uric acid
          - Glutathione (GSH)
          - Bilirubin
          - Melatonin
          - Amino acids
      - **Metal binding proteins**
        - Ferritin
        - Albumin
        - Metal-lothionein (MT)
        - Ceruloplasmin (Cp)
    - **Enzymatic**
      - **Primary defence system**
        - Catalase
        - Superoxide dismutase (SOD)
        - Glutathione peroxidase (GPX)
      - **Secondary defence system**
        - Catalase
        - Superoxide dismutase (SOD)
        - Glutathione peroxidase (GPX)
  - **Exogenous**
    - **Vitamins**
      - Ascorbic acid
      - Ascorbate
      - Tocopherol
      - Tocotrienol
      - Retinol
    - **Trace minerals**
      - Se
      - Zn
      - Cu
      - Mn
      - Fe
    - **Carotenoids**
      - Carotene
      - Zeaxanthin
      - Lutein
      - Lycopene
      - Caricaxanthin
    - **Polyphenols**
      - Flavone
      - Flavanone
      - Flavonol
      - Flavanol
      - Anthocyanin
      - Phenolic acid

Familia de compuestos de **pigmentos** que son sintetizados por plantas y microorganismos, pero **no por animales**.

Son **Lípidos** de naturaleza **terpenoide**, esto significa, que están formados por subunidades repetidas de la molécula de 5 carbonos denominada isopreno



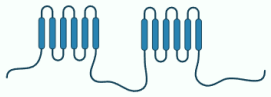

Sunlight
Carbon dioxide
Oxygen
Water

Antioxidants

Enzymatic

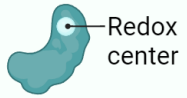
Superoxide dismutase (SOD)

Catalase (CAT)



Thioredoxin (Trx)

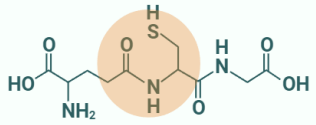
Redox protein



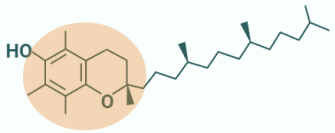
Peroxiredoxin (Prdx)

Nonenzymatic

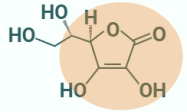
Glutathione (GSH)



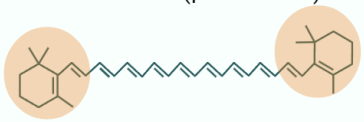
Vitamin E (α-tocopherol)



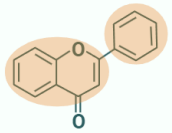
Vitamin C (ascorbic acid)



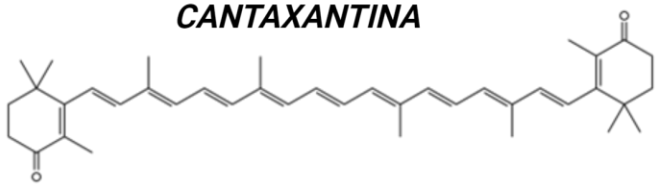
Carotenoid (β-carotene)

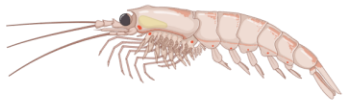


Flavonoid

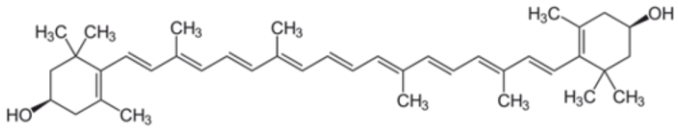


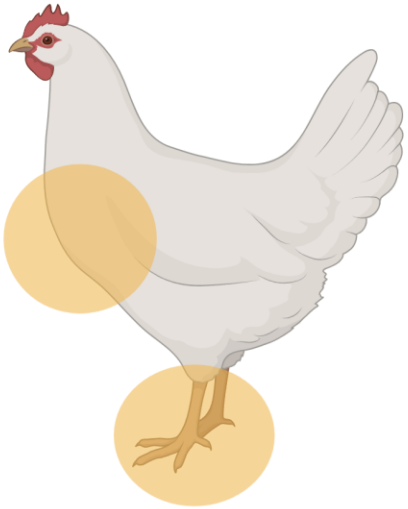
CANTAXANTINA

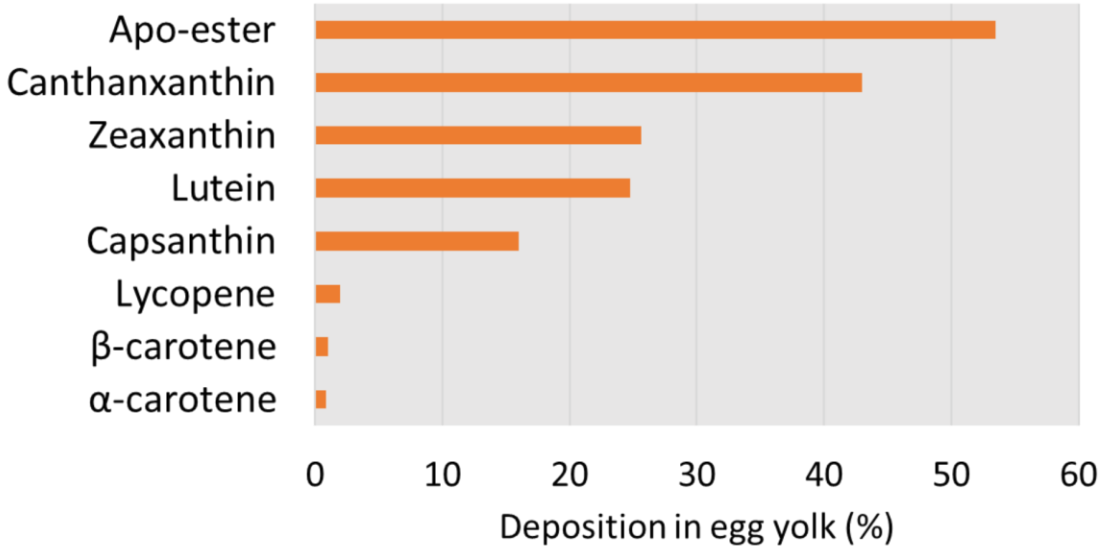




ZEAXANTINA



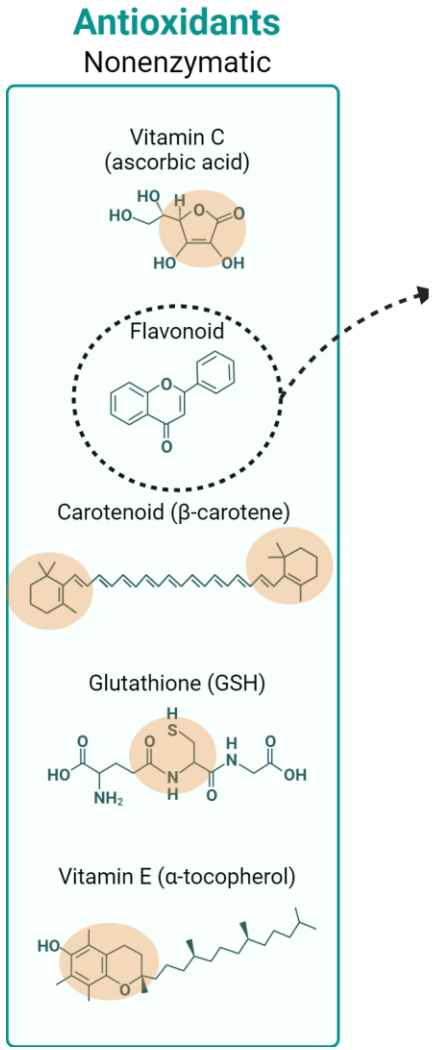




QUIEN ESTA MAS ESTRESADO?

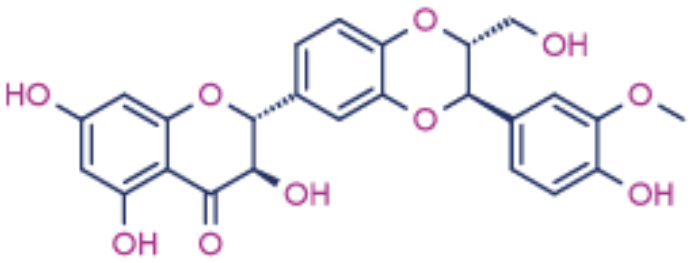
PREVENCIÓN HEPATOCELULAR

SON COMPUESTOS CON **UNO O MAS MECANISMOS DE ACCION**, PERO QUE ACTUAN DIRECTAMENTE SOBRE LA CELULA HEPATICA, **DISMINUYENDO NO SOLO EL AGENTE DAÑINO SINO TAMBIEN REVIRTIENDO LOS EFECTOS** DE ESTOS.



Years

- 2024 (14)
- 2023 (514)
- 2022 (509)
- 2021 (515)
- 2020 (377)
- 2019 (362)
- 2018 (392)
- 2017 (372)
- 2016 (267)
- 2015 (221)
- 2014 (252)
- 2013 (324)
- 2012 (253)
- 2011 (212)
- 2010 (200)
- 2009 (149)
- 2008 (160)
- 2007 (155)
- 2006 (182)
- 2005 (102)
- 2004 (70)
- 2003 (91)
- 2002 (64)
- 2001 (74)
- 2000 (44)



Silimarina (Cardo Mariano)

Biomed. Papers 149(1), 29–41 (2005)
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SILYBIN AND SILYMARIN – NEW EFFECTS AND APPLICATIONS

Vladimír Křen[a,b], Daniela Walterová[b]

Journal of Pre-Clinical and Clinical Research, Vol 1, No 1, 022-026
www.jpccr.eu

REVIEW

Application of silymarin in human and animal medicine

Lidia Radko, Wojciech Cybulski

Division of Toxicology and Environmental Protection, Department of Veterinary Pre-clinical Sciences, Faculty of Veterinary Medicine, Agricultural University, Lublin, Poland

Abstract: Silymarin, the polyphenolic fraction from Milk Thistle (*Silybum marianum*) and its main component silybinin, are used almost exclusively for hepatoprotection in humans. Silymarin offers good protection in various toxic models of experimental liver diseases in laboratory animals. It effects, by antioxidative, anti-inflammatory, antifibrotic, anti-lipid peroxidative, membrane stabilizing and liver regenerating mechanisms. Its clinical applications in humans comprise therapy in alcoholic liver diseases, liver cirrhosis, Amanita mushroom poisoning, viral hepatitis, toxic and drug-induced liver diseases. Recognition of new silymarin derivatives opens new ways for its application in liver therapy. Silymarin application in veterinary medicine is also reviewed.

Key words: Milk Thistle, sylimarin, hepatoprotection

Silymarin Protects Against Liver Damage in BALB/c Mice Exposed to Fumonisin B_1 Despite Increasing Accumulation of Free Sphingoid Bases

ren He, Jiyoung Kim, and Raghubir P. Sharma,[1]

"Silymarin", a Promising Pharmacological Agent for Treatment of Diseases

Gholamreza Karimi,[1,*] Maryam Vahabzadeh,[2] Parisa Lari,[2] Marziyeh Rashedinia,[2] and Mohammad Moshiri[2]

Silymarin for Treating Toxic Liver Disease: International Consensus Recommendations

Anton Gillessen [1], Francesco Angelico [2], Jun Chen [3], Lungen Lu [4], Maria Isabel Lucena [5], Qingchun Fu [6], Qing Xie [7], Raul J. Andrade [8], Wen Xie [9], Xiaoyuan Xu [10], Yanyan Yu [11], Yi-min Mao [12], Yuemin Nan [13]

The use of silymarin in the treatment of liver diseases

R Saller [1], R Meier, R Brignoli

Affiliations + expand

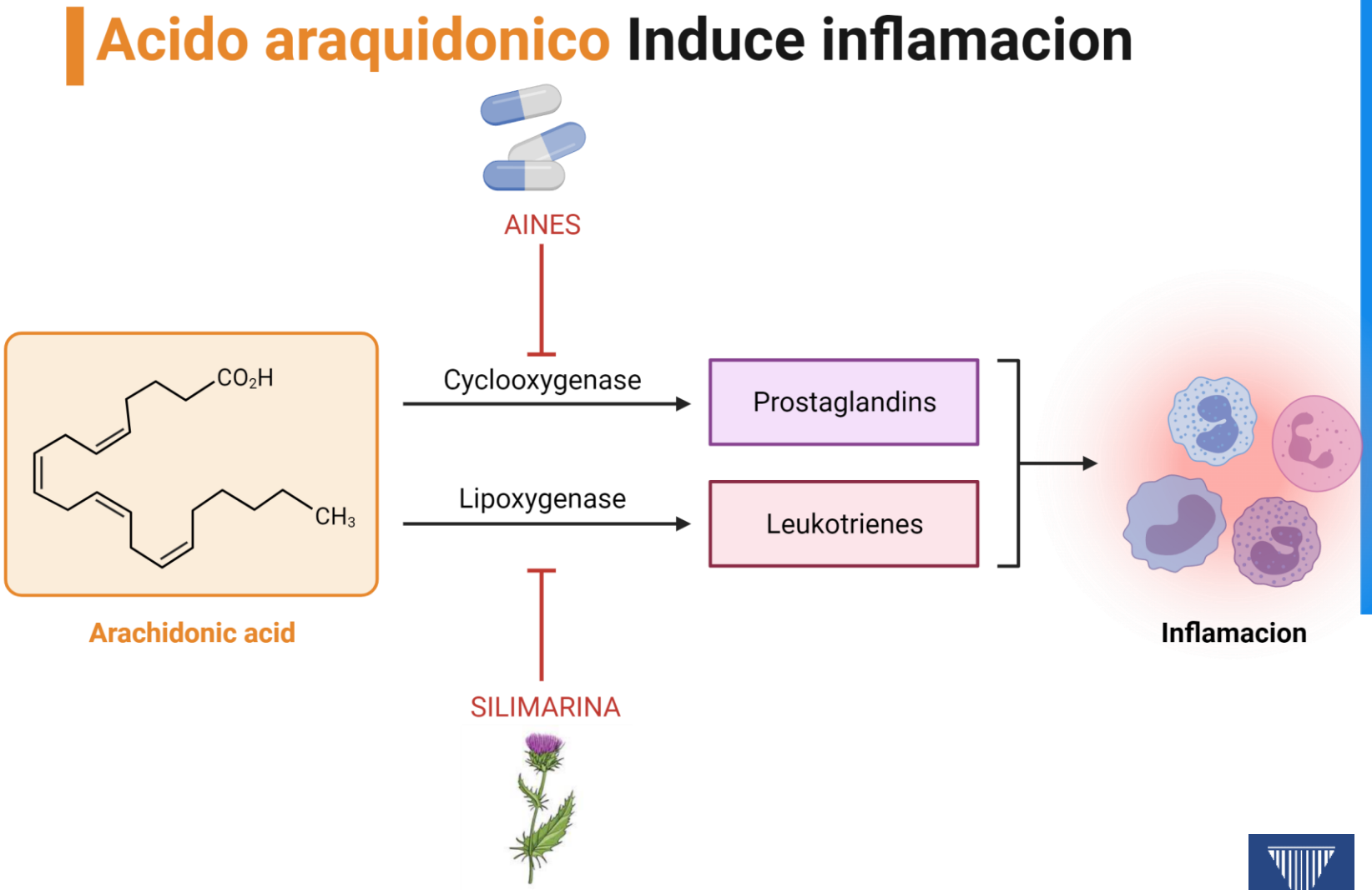
PMID: 11735632 DOI: 10.2165/00003495-200161140-00003

ANTIOXIDANTE

- Acción que comparte con otros flavonoides, pero con mayor potencia debido la cantidad de anillos fenólicos que posee.

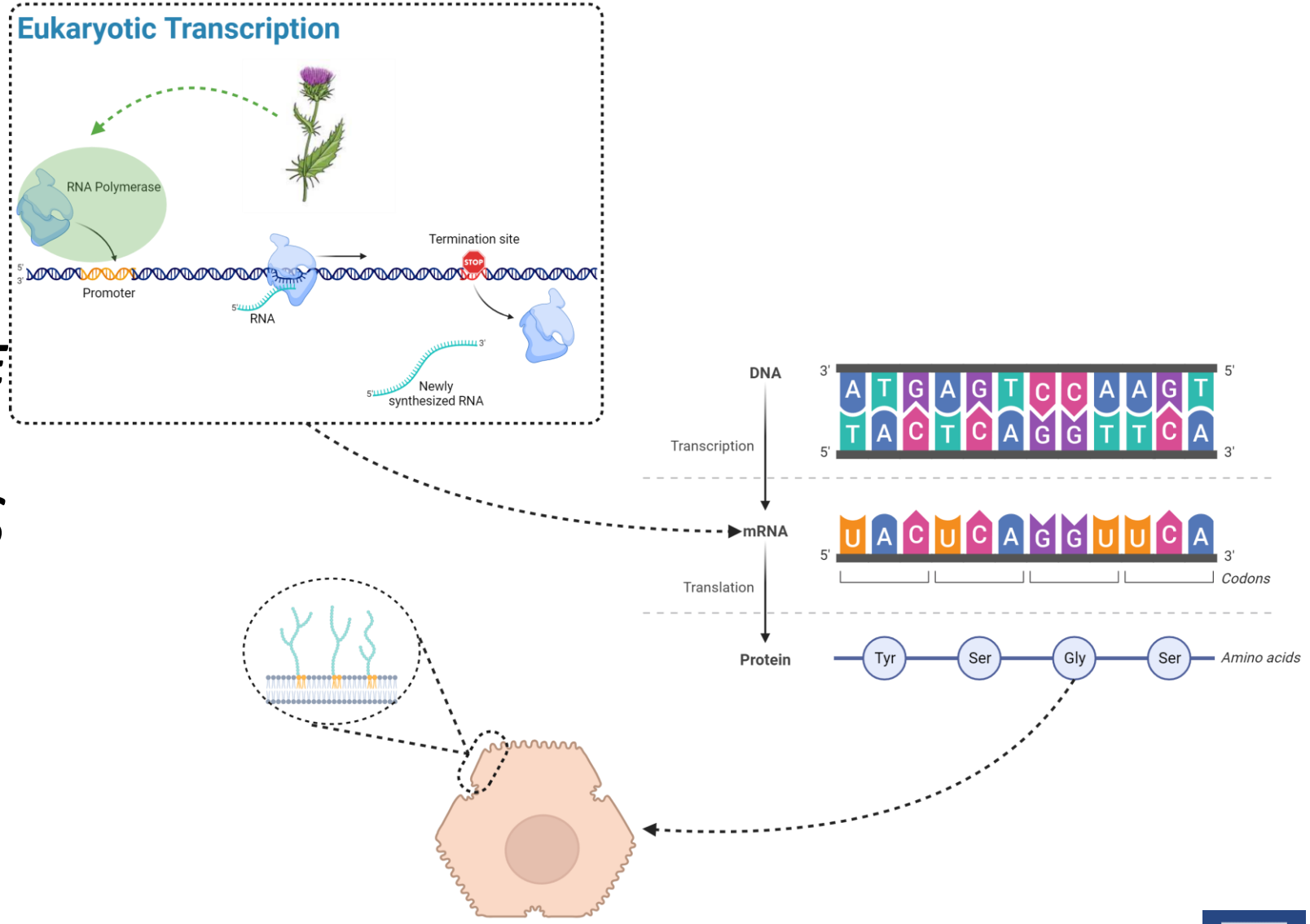
ANTI INFLAMATORIO

LA SILIMARINA PUEDE ***INHIBIR LA SISNTESIS DE LEUCOTRINENOS*** *Y POR ENDE* ***FRENAR LA CASCADA PROINFLAMATORIA*** *DE CITOQUINAS.*



REGENERADOR CELULAR

LA SILIMARINA PUEDE ***ESTIMULAR****, A NIVEL NUCLEAR,* ***LA SINTESIS DE ARN POLIMERASA*** *1 Y CON ELLA LA SINTESIS PROTEICA Y LA REGENERACION CELULAR*



PERO, NO TODO LO QUE BRILLA ES ORO. LA SILIMARINA POSEE MUY BAJA ABSORCIÓN INTESTINAL

Es necesario ***dosis muy elevadas*** *para lograr la biodisponibilidad suficiente para que se expresen* ***todos los mecanismos de acción.***

A review of the bioavailability and clinical efficacy of milk thistle phytosome: A silybin–phosphatidylcholine complex

Article *in* Alternative Medicine Review: a Journal of Clinical Therapeutic · October 2005

Source: PubMed

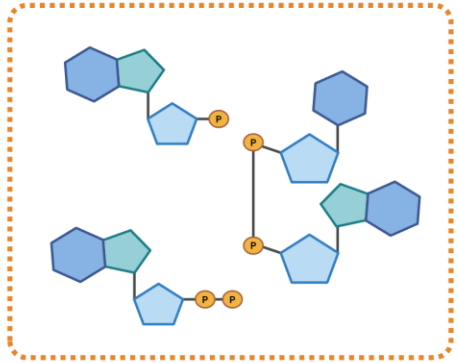
Pharmacokinetic studies on IdB 1016, a silybin–phosphatidylcholine complex, in healthy human subjects

N. BARZAGHI, F. CREMA, G. GATTI, G. PIFFERI* and E. PERUCCA

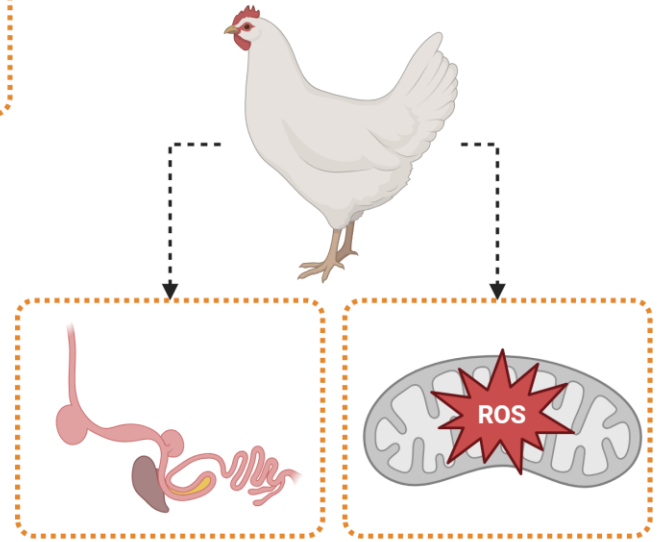
Silybin–Phosphatidylcholine Complex Protects Human Gastric and Liver Cells from Oxidative Stress

ALESSANDRO FEDERICO[1], MARCELLO DALLIO[1], GIOVANNI DI FABIO[2], ARMANDO ZARRELLI[2], SILVIA ZAPPAVIGNA[3], PAOLA STIUSO[3], CONCETTA TUCCILLO[1], MICHELE CARAGLIA[3] and CARMELA LOGUERCIO[1]

FACTORES DEL PRODUCTO



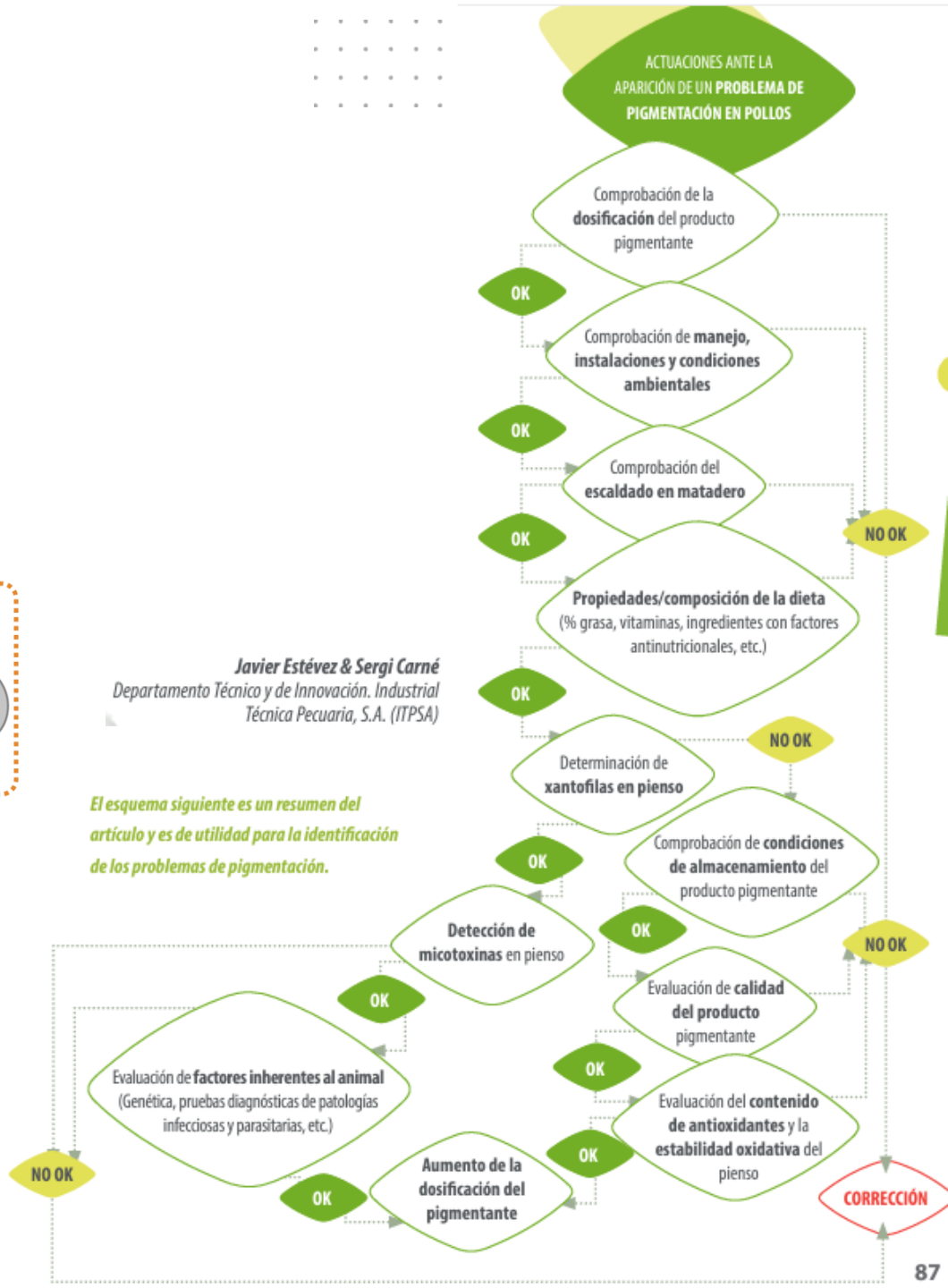
FACTORES DEL ANIMAL

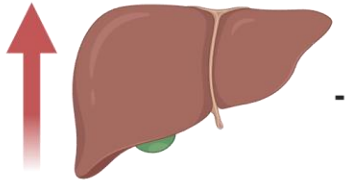


FACTORES DE LA FORMULACION

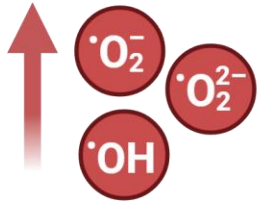
Javier Estévez & Sergi Carné
Departamento Técnico y de Innovación. Industrial Técnica Pecuaria, S.A. (ITPSA)

El esquema siguiente es un resumen del artículo y es de utilidad para la identificación de los problemas de pigmentación.

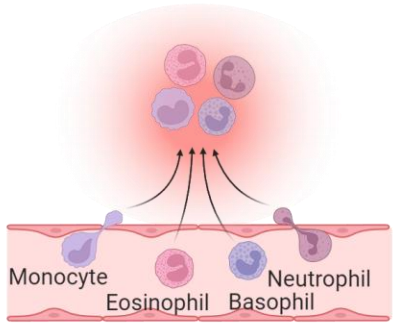




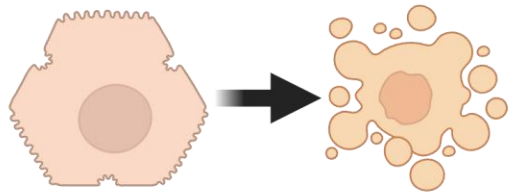
Aumento del metabolismo



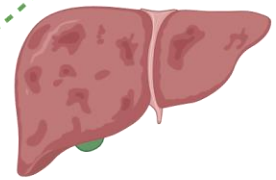
Produccion de ROS



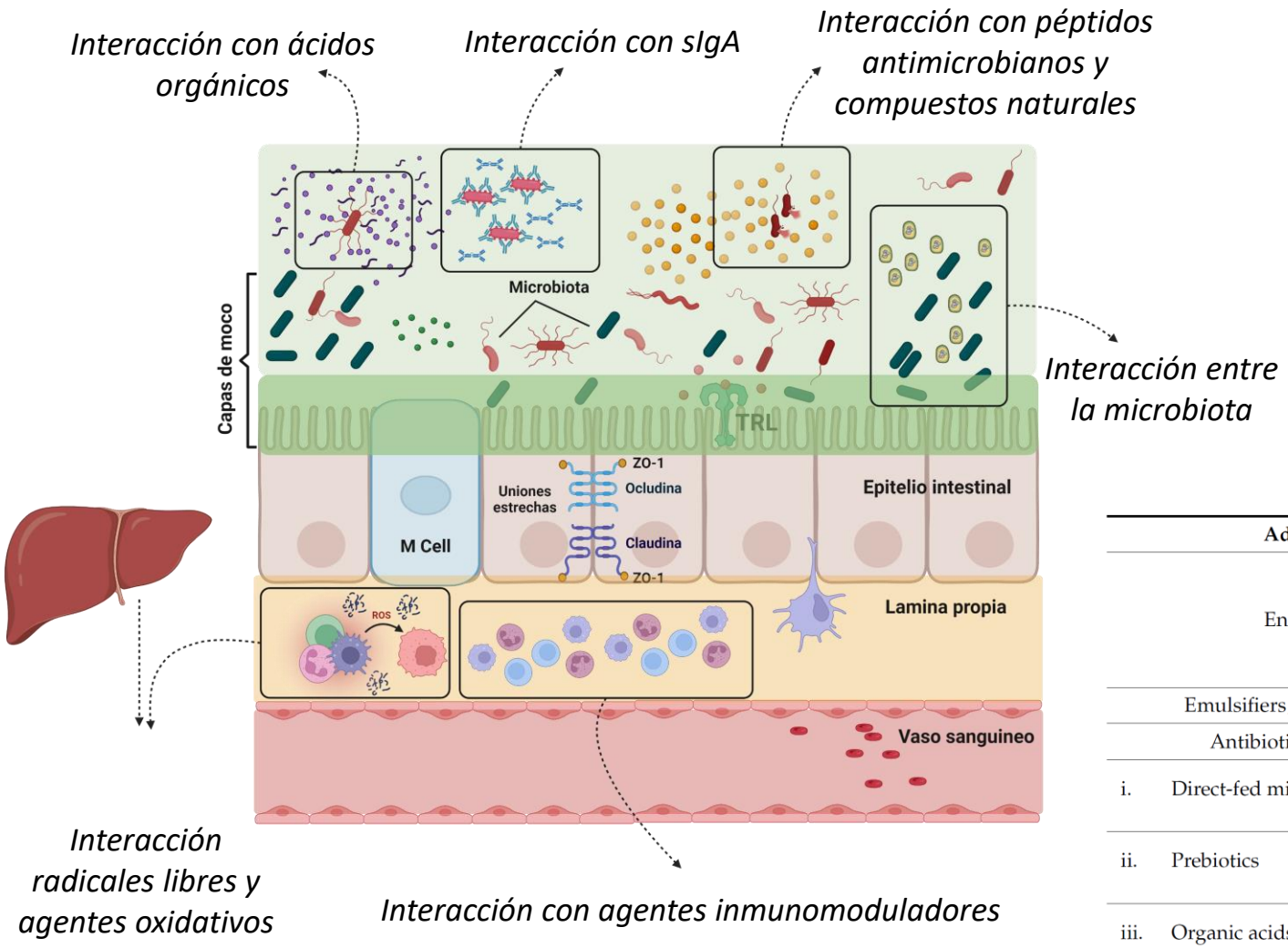
INFLAMACION



DAÑO CELULAR



DAÑO TISULAR



*"Si solo tenemos un **martillo**, vemos a todos los problemas como **clavos**"*

Abraham Maslow

Table 6. List of feed additives useful in young chick nutrition.

Additive		Examples	Reasons for Use
	Enzymes	Xylanases, β-glucanases, phytase, protease	To overcome the anti-nutritional effects of arabinoxylans (in wheat and triticale), β-glucans (in barley), or phytate (in all plant feedstuffs) and to improve the overall nutrient availability and feed value
	Emulsifiers/biosurfactants	Lysophosphatidyl choline	Emulsification and improved lipid digestion
	Antibiotic replacers [1]		
i.	Direct-fed microbials	Probiotics	Provision of beneficial bacterial species such as lactobacilli and streptococci
ii.	Prebiotics	Fructo-oligosaccharides (FOS), mannan oligosaccharides (MOS)	Binding of harmful bacteria
iii.	Organic acids	Propionic acid, diformate	Lowering of gut pH and prevention of the growth of harmful bacteria
iv.	Botanicals	Herbs, spices, plant extracts, essential oils	Prevention of the growth of harmful bacteria
v.	Antimicrobial proteins/peptides	Lysozyme, lactacin F, lactoferrin, α-lactalbumin	Prevention of the growth of harmful bacteria
	Synthetic AA	DL-methionine, L-lysine, L-threonine	Diet formulation based on digestible AA and ideal protein concept

[1] Due to the ban or restriction on the use of in-feed antibiotics, a multitude of compounds (individually and in combination) are being tested/used to improve the GIT health.

Review

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Gracias!

ESCANEAR PARA ACCEDER A LA BIBLIOGRAFIA

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