



DIET INFLUENCE IN **PROTEIN** AND **FATTY ACID** CONTENT OF BREAST MILK FROM DIFFERENT ORIGIN



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BIOACTIVE PROTEINS

LACTOFERRIN (LF)

HAPTOCORRIN (HC)

LONG-CHAIN
FATTY ACIDS

ARACHIDIC ACID
LINOLELAIDIC ACID
ELAIDIC ACID

CIS-10-HEPTADECANOIC ACID
PALMITOLEIC ACID
MYRISTOLEI ACID
TRIDECANOIC ACID
CAPRYLIC ACID





OBJECTIVES

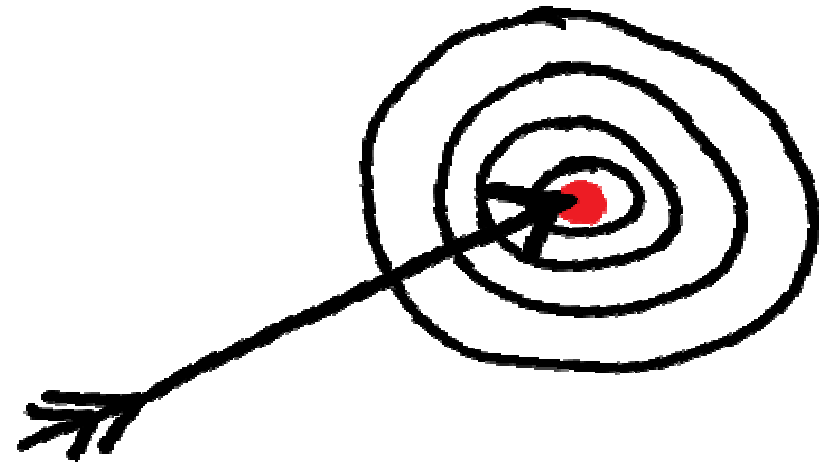
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OUR OBJECTIVES

Study the effect of maternal diet and geographical localization in the protein and fatty acid composition in breast milk.



SPECIFIC OBJECTIVES:

- The determination of Lactoferrin content in breast milk from women from Honduras, Egypt and Spain.
- The determination of Haptocorrin content in breast milk from women from Honduras, Egypt and Spain.
- The determination of long-chain fatty acid content in breast milk from women from Honduras, Egypt and Spain.
- The comparison of protein and fatty acid profiles of human milk samples from each origin.



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MATERIAL AND METHODS

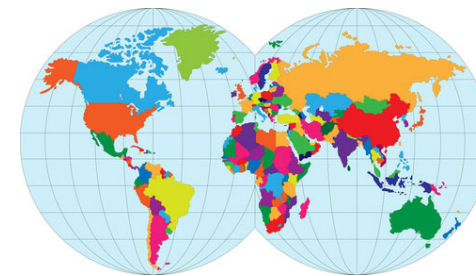


Breast milk samples were analyzed from each point of origin: 8 samples from Egypt, 7 samples from Honduras and 2 samples from Spain.

These samples were taken during the 2nd to 4th month after birth

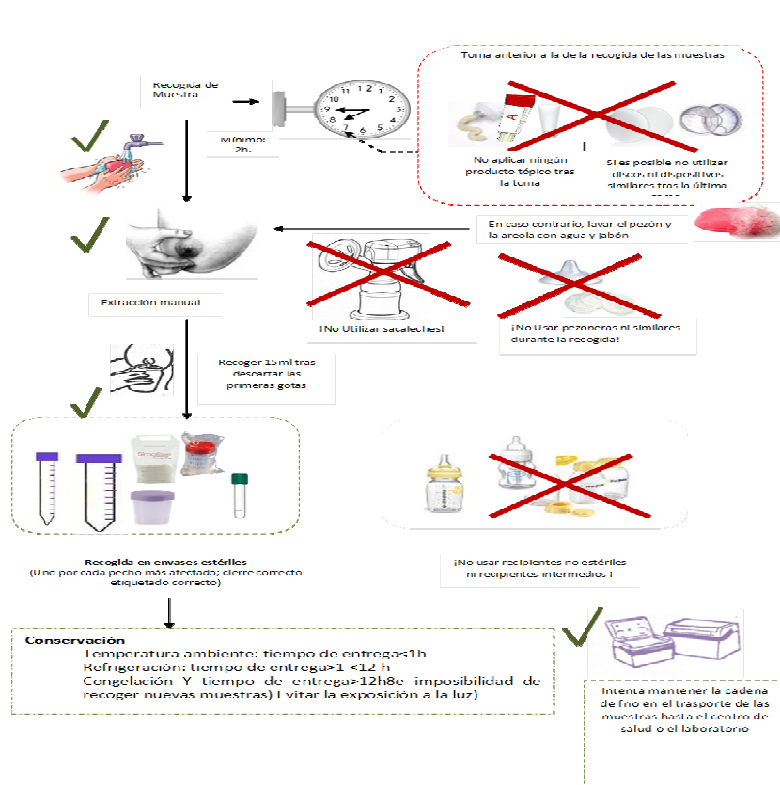


Lactoferrin and Haptocorrin analysis
Fatty Acid Extraction and Analysis



MATERIAL AND METHODS	RESULTS	CONCLUSIONS
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MATERIAL AND METHODS



DECLARACIÓN DE CONSENTIMIENTO INFORMADO

D./Dña de años de edad¹ y con DNI nº, manifiesta que ha sido informado/a sobre los beneficios que podría suponer la extracción de un volumen de 100 ml de mi Leche materna para cubrir los objetivos del Proyecto de Investigación titulado "COMPARACIÓN DE LA MICROBIOTA, COMPUESTOS BIOACTIVOS Y MICRONUTRIENTES DE LECHE MATERNA PROCEDENTE DEL SUR DE ESPAÑA Y DISTINTAS REGIONES DE BRASIL, EGIPTO, HONDURAS, Y CAMBOYA. VALORACIÓN NUTRICIONAL DE LAS MADRES Y DE LOS LACTANTES" con el fin de mejorar la aparición de determinadas patologías en el lactante así como posibles diferencias en el estado de salud materno-infantil de los distintos países.

He sido informado/a de los posibles perjuicios que la extracción de una muestra de 100 ml de leche materna puede tener sobre mi bienestar y salud.

He sido también informado/a de que mis datos personales serán protegidos e incluidos en un fichero que deberá estar sometido a y con las garantías de la ley 15/1999 de 13 de diciembre.

He sido también informado de que puedo abandonar en cualquier momento mi participación en el estudio sin dar explicaciones y sin que ello me suponga perjuicio alguno.

Tomando ello en consideración, OTORGO mi CONSENTIMIENTO a que esta extracción tenga lugar y sea utilizada para cubrir los objetivos especificados en el proyecto.

XXX, a XX de XXXXX de 20XX.

Fdo. D/Dña

¹ En caso de ser menor de edad, deberá acompañarse en todo caso del consentimiento informado expreso de ambos padres.

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MATERIAL AND METHODS

WETERN BLOT

Diagram of the electrophoresis of the Western Blot procedure

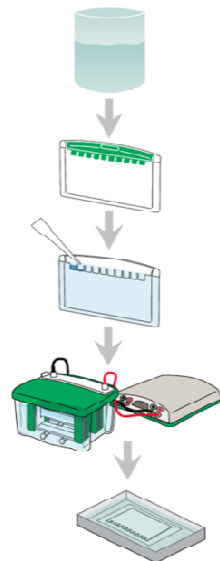
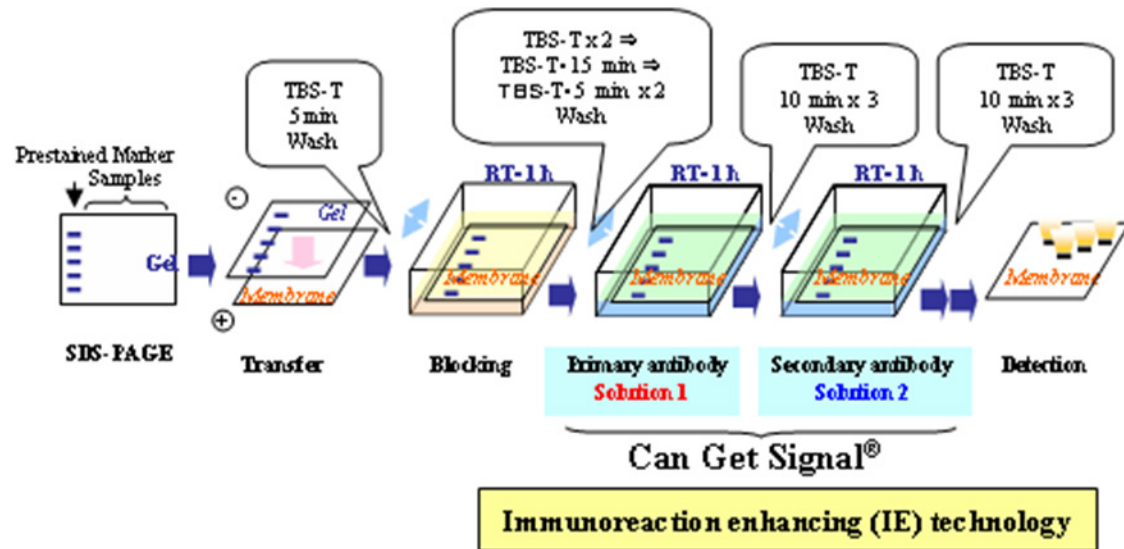


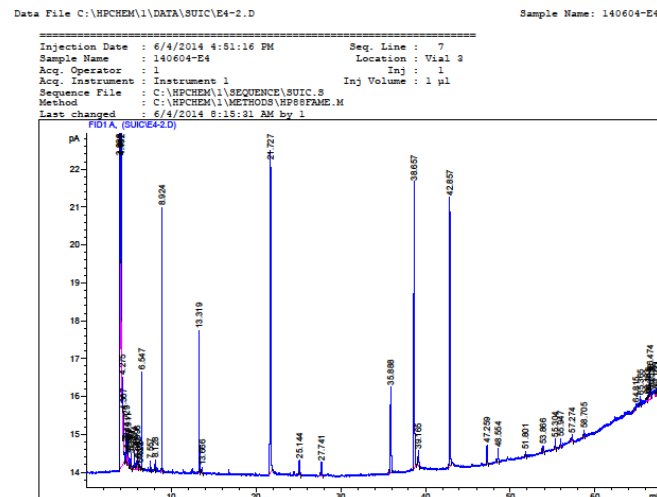
Diagram of the antibody exposition phase of the Western Blot procedure





MATERIAL AND METHODS

FATTY ACID EXTRACTION AND ANALYSIS



•Or-Rashid M.M., Fisher R., Karrow N., AlZahal O., McBride B.W. (2010) *Fatty acid profile of colostrum and milk of ewes supplemented with fish meal and the subsequent plasma fatty acid status of their lambs.* Journal of Animal Science



RESULTS

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LACTOFERRIN

AND

HAPTOCORRIN

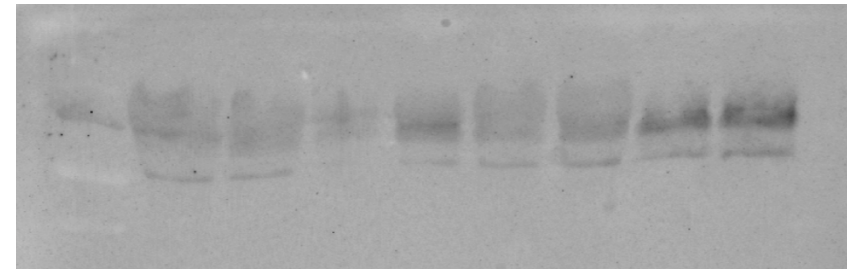
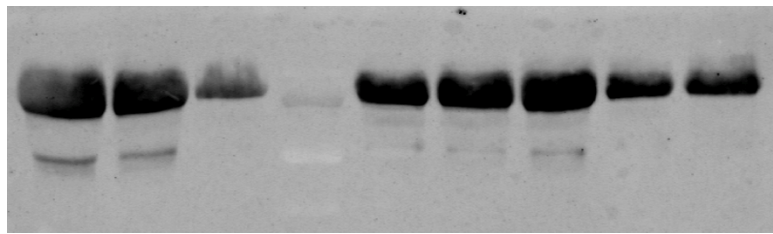


Table 1. Lactoferrin and Haptocorrin determination (%) in samples from Spain, Egypt and Honduras.

Spain	Egypt	Honduras	
100 ± 7.50^a	35.14 ± 4.85^b	16.84 ± 1.36^c	Lactoferrin
100 ± 31.63^b	345.98 ± 29.45^a	296.86 ± 38.25^a	Haptocorrin

Results have been presented as mean \pm standard error of the mean ($\mu \pm$ SEM). Different letters (a,b,c) in the same row denote statistical significance differences ($p < 0.05$)



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LACTOFERRIN



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HAPTOCORRIN

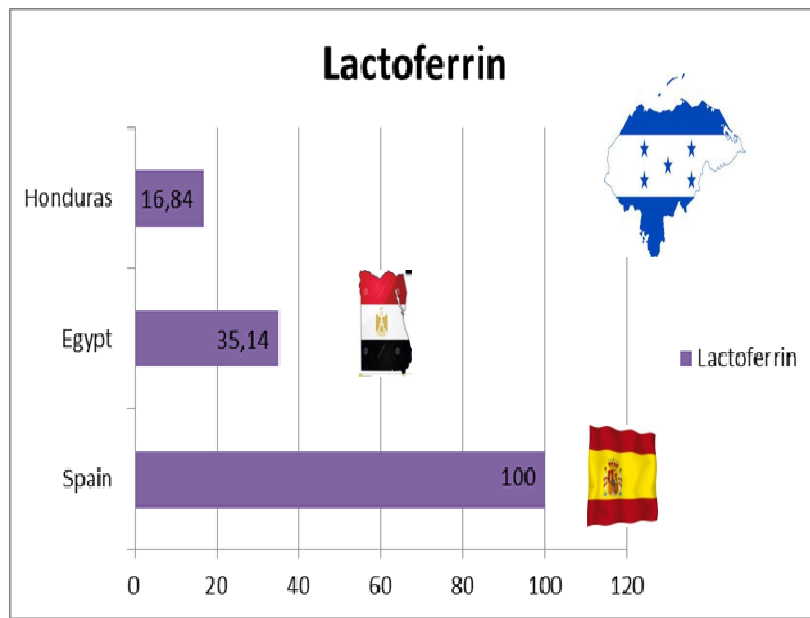


Figure 1. Percentage of LF in human breast milk from different countries

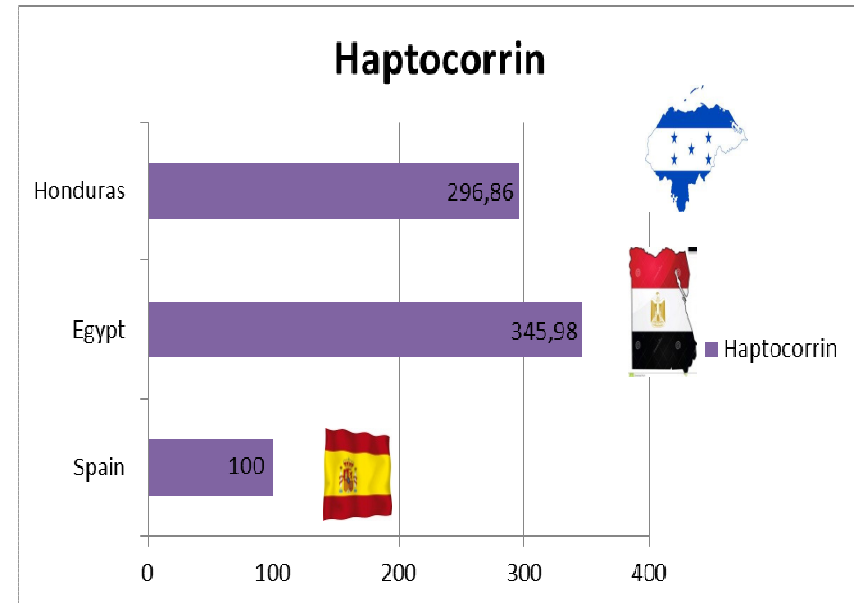


Figure 2. Percentage of HC in human breast milk from different countries



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LONG-CHAIN FATTY ACIDS

Table 2. Concentration of Volatile Fatty Acid (%) in milk samples from Egypt and Honduras.

Volatile Fatty acid	Egypt	Honduras
Caprylic acid	5,23±0.27 ^a	9,76±0.30 ^b
Tridecanoic acid	4,90±4.59 ^a	3,96±0.43 ^a
Myristoleic acid	4,40±2.73 ^a	4,34±0.43 ^a
Palmitoleic acid	12,24±6.56 ^a	16,59±1.58 ^b
Cis-10-Heptadecanoic acid	3,94±0.60 ^a	5,825±0.31 ^b
Elaidic acid	6,43±2.15 ^a	9,11±0.41 ^b
Linolelaidic acid	14,16±9.91 ^a	18,93±2.13 ^b
Arachidic acid	40,99±27.31 ^a	28,21±3.13 ^b

Results have been presented as mean ±standard error of the mean ($\mu \pm SEM$).

Different letters (a,b) in the same row denote statistical significance differences

($p < 0.05$)



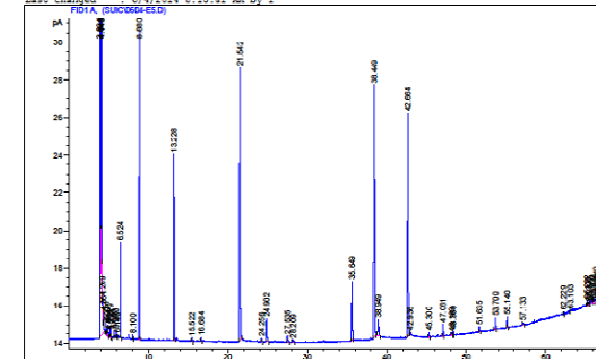
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Sample Name: 140604-ES

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Acq. Operator : l                        Inj : 1
Acq. Instrument : Instrument 1           Inj Volume : 1 µl
Sequence File : C:\MSDCHEM\1\METHODS\SUIC.S
Method : C:\MSDCHEM\1\METHODS\MSDSFAME.M
Last changed : 6/4/2014 8:15:21 AM by l

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RESULTS

LONG-CHAIN FATTY ACIDS

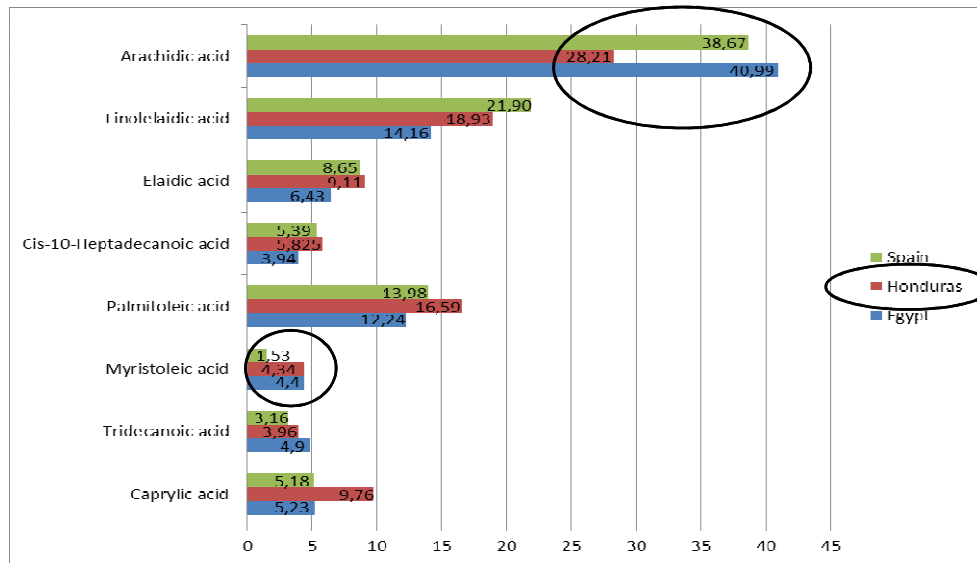


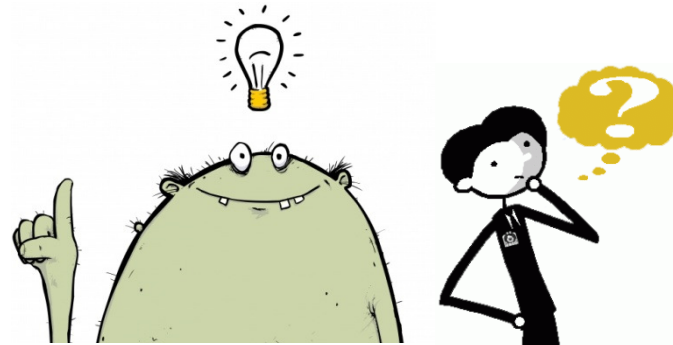
Figure 3. Relative percentage of LCFA from Spain, Honduras and Egypt



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The differences observed in the three countries could perfectly be because of the different diets consumed in each country. Infants in Spain ingest more LF so that could explain a lower incidence in gastrointestinal infections, lower anemia rates, etc. Infants in Egypt and Honduras consume more HC, so that would involve a better neural development and lower megaloblastic anemia rates.

Infants from all three countries have a high consumption of arachidic acid which would help with the development of the nervous system and the immune system.



Conclusión



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ACKNOWLEDGEMENTS

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The
End



THANK YOU SO **MUCH**