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CTC
centro tecnolóxico da carne

TENDENCIAS NO DESENVOLVEMENTO DE PRODUTOS CARNICOS FUNCIONAIS

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Productos Cárnicos Funcionales

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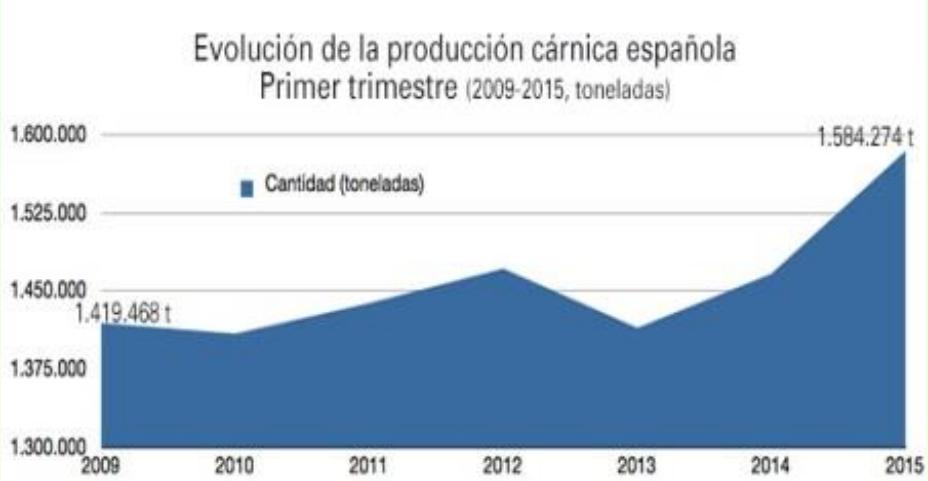
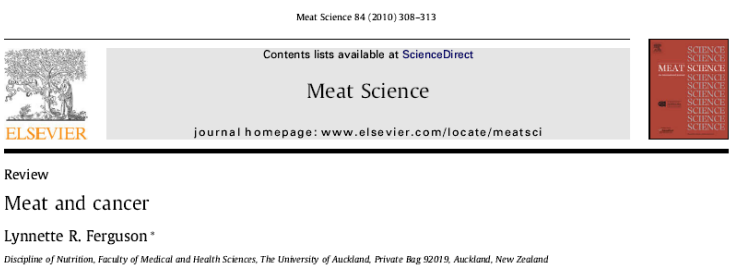


Nutrientes	Ingesta total por día	Nutrientes de la carne y derivados	Contribución (%) de la carne y derivados en la ingesta de cada nutriente
Proteína (g)	98,7	30,6	31
Grasas (g)	104,1	26,0	25
Colesterol (mg)	380,0	68,4	18
Hierro (mg)	14,9	2,7	18
Cinc (mg)	9,6	2,5	26
Magnesio (mg)	375,1	41,3	11
Sodio (mg)	2526,3	555,8	22
Potasio (mg)	2951,5	413,2	14
Fosforo (mg)	1414,7	297,1	21
Selenio (µg)	58,6	10,0	17
Tiamina (mg)	1,9	0,5	27
Riboflavina (mg)	1,5	0,3	17
Niacina (mg)	42,5	9,8	23
Vitamina B6	1,8	0,5	26
Vitamina B12	7,0	1,0	15


Meat Science 84 (2010) 308–313

Contents lists available at ScienceDirect

Meat Science

journal homepage: www.elsevier.com/locate/meatsci

ELSEVIER

Review

Meat and cancer

Lynnette R. Ferguson *

Discipline of Nutrition, Faculty of Medical and Health Sciences, The University of Auckland, Private Bag 92019, Auckland, New Zealand

Desarrollo de productos cárnicos funcionales

La carne y sus derivados constituyen alimentos adecuados para vehicular compuestos

Alimentos funcionales

Productos Cárnicos Funcionales

FOSHU: "Alimentos para uso específico en la salud"

Europa (Diplock et al., 1999) : Definición consensuada por un comité de expertos

"un alimento funcional es aquel que, más allá de su valor nutricional habitual, ha demostrado satisfactoriamente tener un efecto beneficioso sobre una o más funciones específicas en el organismo en una forma que resulta relevante para mejorar el estado de salud y bienestar y/o para la reducción de riesgo de enfermedad."

Productos Cárnicos Funcionales

ALIMENTOS FUNCIONALES

Modification of carcass composition (animal tissue) using genetic and nutritional strategies

- Reduction of fat content
- Improvement of fatty acid profile: reduce SFAs, increase MUFAs, PUFAs, CLA, improve PUFA/SFA, n-6 /n-3 PUFA ratios
- Reduction of cholesterol content
- Increase in mineral contents (selenium, iron, etc.)
- Increase in antioxidants (vitamin E, vitamin C, flavonoids, etc.)

✓ Traditional and new meat raw materials

✓ Non-meat ingredients and additives

Meat product reformulation

- Reduction of fat content and calories.
- Improvement of fatty acid profile (replacement of animal fat by vegetable and/or marine oils): reduction of SFA and TFA contents and increase in MUFAs, PUFAs (LNA, EPA, DHA), CLA, and improvement of PUFA/SFA and n-6/n-3 PUFA ratios.
- Reduction of cholesterol content.
- Improvement of amino acid quality (non-meat proteins).
- Incorporation of prebiotics, probiotics, synbiotics.
- Enrichment with minerals (selenium, calcium, iron, etc.).
- Incorporation of vitamins and antioxidants (folic acid, tocopherols, carotenoids, etc.).
- Reduction of sodium, nitrite and phosphate contents.
- Elimination of allergens.
- Incorporation of other healthy ingredients (walnut, plant sterol, seaweed, etc.).

Meat processing, storage and consumption conditions

- Minimizing the impact of these steps in terms of loss of bioactive compound contents and bioavailability
- Promotion of formation of healthy compounds (bioactive peptides, CLA).
- Minimizing the formation of unhealthy compounds (polycyclic aromatic hydrocarbons, heterocyclic amines, biogenic amines, nitrosamines and lipid oxidation products).

Agents inducing change in composition

Animal producers

Meat processors

Meat distribution

Consumers

Productos Cárnicos Funcionales

Reducir o eliminar la presencia de componentes con efectos negativos

- **SODIO:** *sales*
- **NITRATOS/NITRITOS:** *(vegetales, vitaminas, colorantes, etc.)*
- **GRASA (colesterol, calorías)**

Favorecer la presencia de compuestos con efectos beneficiosos para la salud

- **PROBIÓTICOS:** *Bifidobacterium spp, etc.*
- **ANTIOXIDANTES:** *vitaminas, compuestos fenólicos, etc),*
- **LÍPIDOS:** *aceites vegetales, pescado, etc.*

Productos Cárnicos Funcionales

OPTIMIZACIÓN

- Contenido lipídico
- Perfil lipídico

	Ing. diaria	Proc.carne	(%) carne/total
Calorías (kcal/día)	2.634	392	14,9
Proteína (g/día)	93,5	30,5	32,6
Carbohidratos (g/día)	294	0,35	0,1
Grasas (g/día)	121 (41)*	29,8	24,6
AGS (g/día)	34,9 (12)	11,6	33,2
AGMI (g/día)	55,2 (19)	13,0	23,5
AGPI (g/día)	19,8 (6)	2,4	12,1
Colesterol (mg/día)	440	175	39,8

**Entre paréntesis % kcal respecto del total ingerido.*

Estrategias de optimización del contenido y perfil lipídico en productos cárnicos

Materias primas cárnicas

Ingredientes no cárnicos

- Agua
- Fibra
- Proteínas: Proteína de soja
- Adición directa de aceites
- Aceites emulsificados

Productos Cárnicos Funcionales

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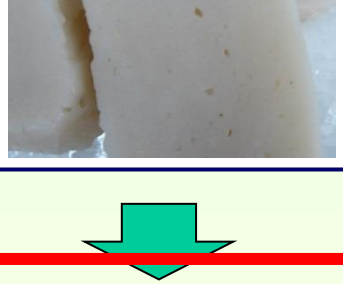
Ingredientes no cárnicos

Gel de Konjac



- Chorizo
- Merguez

Agentes de carga de aceite

- Konjac

Meat Science 92 (2012) 144–150

Contents lists available at SciVerse ScienceDire

Meat Science

journal homepage: www.elsevier.com/locate

Konjac gel as pork backfat replacer in dry fermented sa
quality characteristics

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Backfat replacer
Konjac
Dry fermented sausages
Technological properties
Microbiological analysis
Sensorial analysis

ABSTRACT

The effect of replacing animal fat (0%, 50% and 80% of
processing and quality characteristics of reduced and
loss, pH, and water activity of the sausage were affe
Low lipid oxidation levels were observed during proce
The fat content for normal-fat (NF), reduced-fat (RF)
13.79%, respectively. This means an energy reduction o
decreases there is an increase ($P<0.05$) in hardness an
No differences were appreciated ($P>0.05$) in the prese
The sensory panel considered that NF and RF products

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Food Control 31 (2013) 158–165

Contents lists available at SciVerse ScienceDirect

Food Control

journal homepage: www.elsevier.com/locate/foodcont

Chilled storage characteristics of low-fat, n-3 PUFA-enriched
sausage reformulated with a healthy oil combination stabilize

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ABSTRACT

A healthier oil combination (olive, linseed and fish oils) stabilized i
replacement to reformulate low-fat, n-3 polyunsaturated fatty
sausage ("chorizo"). Different characteristics were studied during
activity, texture profile, lipid oxidation, microbiological changes a
values of the dry sausage were not affected ($P > 0.05$) by the sausa

LWT - Food Science and Technology 51 (2013) 158–163

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LWT - Food Science and Technology

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Healthy oil combination stabilized in a konjac matrix as por
low-fat, PUFA-enriched, dry fermented sausages

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Dry fermented sausages
Improving fat content
Konjac
Healthier oil combination

ABSTRACT

Dry fermented sausage ("Chorizo") was reformulated to produce
content and improved fatty acid profile) by replacing the pork
(olive, linseed and fish oils) stabilized in a konjac matrix. Proxi
oxidation and sensory analysis were studied. The fat content w
316 g/kg in the normal fat sausages. The incorporation of an o
saturated fatty acid content and increased ($P < 0.05$) polyunsatu
$n-6/n-3$ ratio in dry sausage. Reducing fat decreased ($P < 0.0$
cohesiveness, with no effect ($P > 0.05$) on springiness and
produced a decrease ($P < 0.05$) in all sensorial parameters, comp
in all the sausages appearance, flavour and juiciness scored above

Objetivos

1.- La reducción del contenido en grasa de chorizo reformulado mediante la sustitución de distintas proporciones (0, 50 y 80 %) de grasa animal por cantidades equivalentes de un gel de konjac (KGM).

2.- Agentes de carga a base de konjac estabilizando aceite de oliva y una combinación de los aceites de oliva, semilla de lino y de pescado se han empleado como sustitutos de grasa animal en chorizo (otros productos)

Productos Cárnicos Funcionales

Harina de konjac

Almidón

i-carragenato

Agua

Hidróxido cálcico

Almacenamiento a 2 °C/24h

Agente de carga

Gel de konjac

Procesado: CHORIZO

Control (20% grasa animal)	KGM50 (50% grasa reemplazada por KGM)	KGM80 (80% grasa reemplazada por KGM)

Procesado

Etapa 1: 48h 23 ºC 90% HR,

Etapa 2: 13 ºC 80 - 70% HR hasta 17 días

Resultados: CHORIZO

Muestras	Humedad	Cenizas	Proteína	Grasa
C	31,87 ± 0,73 [a]	6,51 ± 0,05 [a]	25,64 ± 0,13 [a]	29,96 ± 0,49 [c]
KGM50	33,32 ± 0,27 [b]	7,60 ± 0,04 [b]	30,37 ± 0,81 [b]	19,69 ± 0,41 [b]
KGM80	35,27 ± 0,28 [c]	8,14 ± 0,04 [c]	32,52 ± 0,44 [b]	13,79 ± 0,48 [a]

Reducción de grasa: ≈ 34%-54%

Reducción de energía (Kcal/100g) del 14,8%-24,5%

Productos Cárnicos Funcionales

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Estrategias de optimización del contenido y perfil lipídico en productos cárnicos

Ingredientes no cárnicos

Emulsiones

- Aceite en agua (O/W)
- Dobles (O/W/O)
- Gelificadas

Food Research International 43 (2010) 2068–2076

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Food Research International

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Influence of emulsified olive oil stabilizing system used for pork backfat replacement in frankfurters

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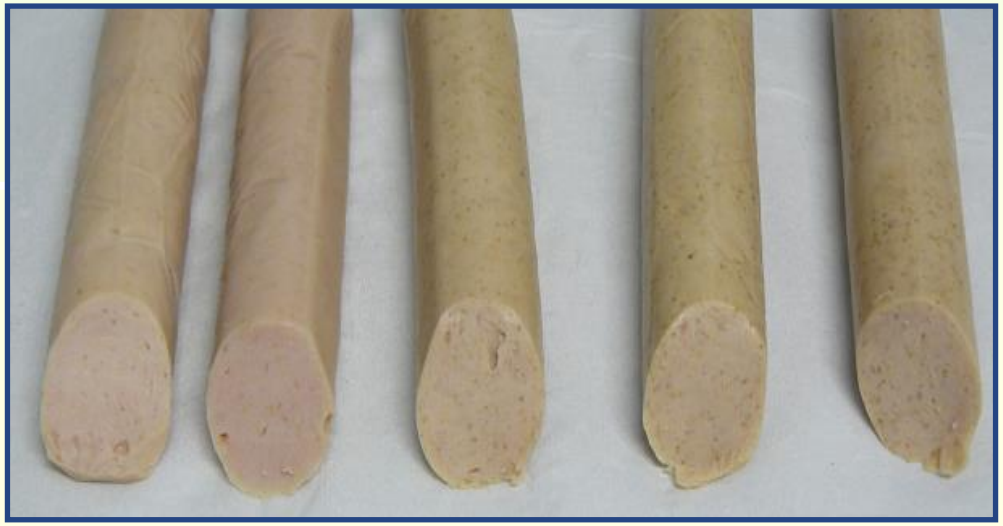
Oil-in-water emulsion
Frankfurter
Olive oil
Physicochemical properties
Microstructure
Sensory analysis

ABSTRACT

The purpose of this study was to evaluate the influence of emulsified olive oil stabilizing systems used for pork backfat replacement on frankfurter characteristics. The oil-in-water emulsions were stabilized with various protein systems formulated using sodium caseinate, soy protein isolate, meat protein and microbial transglutaminase. These emulsions presented excellent fat and water binding properties, with no noticeable release of exudate after heating. Penetration parameters differentiated several types of rheological behaviour in oil-in-water emulsions as affected by the emulsified olive oil stabilizing system. Generally frankfurters made with the different oil-in-water emulsions presented good water and fat binding properties, greater ($P<0.05$) hardness, cohesiveness and chewiness and poorer ($P<0.05$) adhesiveness than control (all pork fat) frankfurters. Matrix morphological characteristics of frankfurters were affected by the type of oil-in-water emulsions used as non-meat ingredients. General acceptability scores of frankfurters prepared with the olive oil-in-water emulsions were similar to those of samples formulated with all pork fat.

Emulsiones Gelificadas: Objetivo

Desarrollo de salchichas tipo frankfurt reemplazando grasa animal por emulsiones gelificadas formuladas con aceite de oliva, proteínas vegetales y gelificantes en frío.



Emulsiones Gelificadas: Resultados

Composición

Muestras	Humedad	Cenizas	Proteína	Grasa
NF/Tc	55,49 ± 0,28 [a]	3,25 ± 0,03 [a]	16,31 ± 0,50 [a]	24,15 ± 0,11 [b]
RF/Tc	66,83 ± 0,11 [b]	3,21 ± 0,03 [a]	15,82 ± 0,07 [b]	14,47 ± 0,10 [a]
RF/T	66,97 ± 1,36 [b]	3,43 ± 0,04 [b]	16,21 ± 0,04 [a]	14,32 ± 0,11 [a]
RF/A	66,05 ± 0,31 [b]	3,48 ± 0,01 [b]	16,07 ± 0,04 [a]	14,32 ± 0,19 [a]
RF/G	65,71 ± 0,21 [b]	3,22 ± 0,02 [a]	16,49 ± 0,47 [a]	14,05 ± 0,27 [a]

Reducción de grasa: ≈ 40%

Reducción AGS: ≈ 60%

Productos Cárnicos Funcionales

- Reglamento (CE) nº 1924/2006 del Parlamento Europeo y del Consejo, de 20 de diciembre de 2006, relativo a las declaraciones nutricionales y de propiedades saludables en los alimentos (Diario Oficial de la Unión Europea L 404 de 30/12/2006).

Declaración de propiedad nutricional

Declaración de propiedades saludables

Reglamento (CE) nº 432/2012

Muchas gracias por su atención

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