Goat production in Spain

David R. Yáñez-Ruiz

Animal Nutrition, CSIC, Granada, Spain

CONSEJO SUPERIOR
DE INVESTIGACIONES
CIENTÍFICAS

Small Ruminants Research group

Alternative feed resources

GHG Emissions

Rumen microbial ecosystem

Goat production in Spain

- Introduction, background
- Main local dairy breeds
- Sector organization
- On farm Production data
- Production costs
- Feeding by-products
- Conclusions

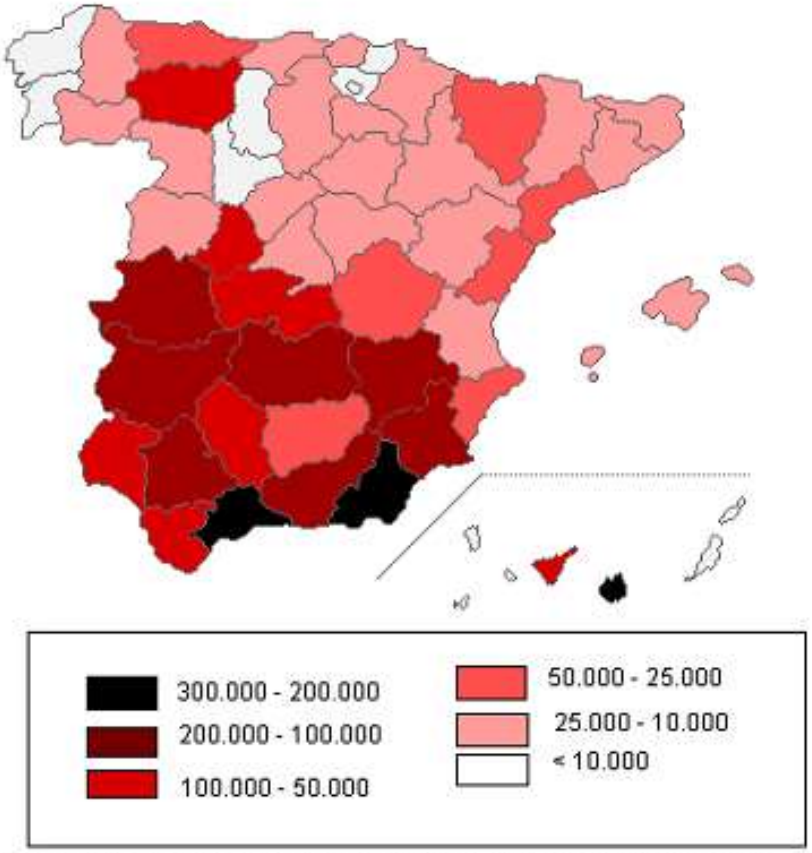
Goat production in Spain: background

- Tradition
  - goat kids 20 kg after spring grazing
  - Cheese manufactaring during season

a) 1980s: kid meat shifted to 1 month old
b) Changes in milk processing health standards – shift to milk selling
c) 1990s: feedstuffs prices fell and milk value increased: intensification

- Only 9 % of goat milk is processed on farm / cooperative

Geographic distribution



- **Intensive: 20 to 50 %**
- **Semi-extensive & extensive: 80 to 50%**

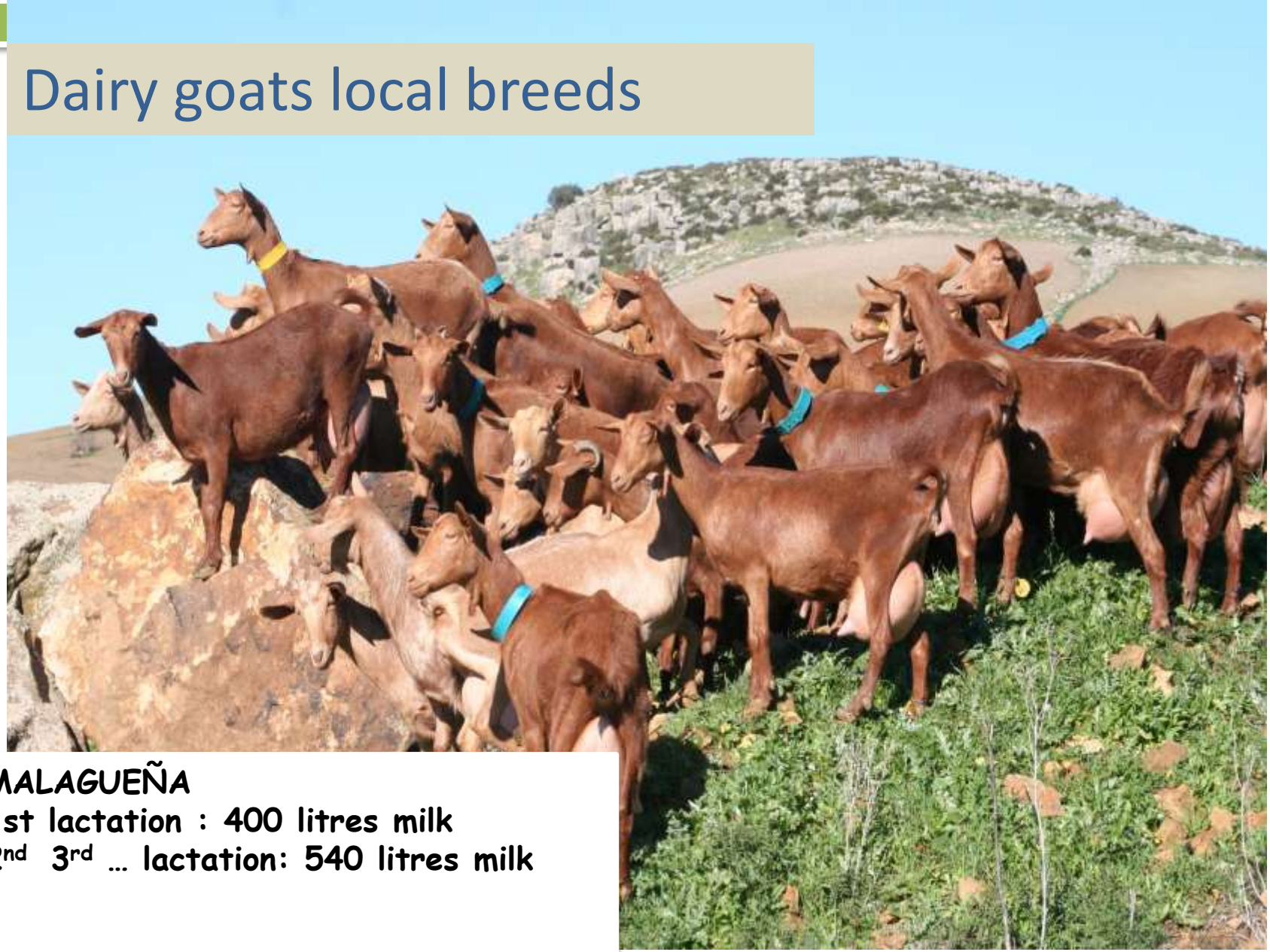
Dairy goats local breeds

MURCIANO-GRANADINA

1st lactation: 350-400 litres milk
2nd 3rd …: 530-600 litres milk

Sexual maturity: 7-8 months (30 kg)
Milk fat: 5.6 – 5.8
6-6.5 litres milk / 1 kg cured cheese

Dairy goats local breeds



MALAGUEÑA
1st lactation : 400 litres milk
2nd 3rd … lactation: 540 litres milk

Dairy goats local breeds

FLORIDA.

Dairy goats local breeds

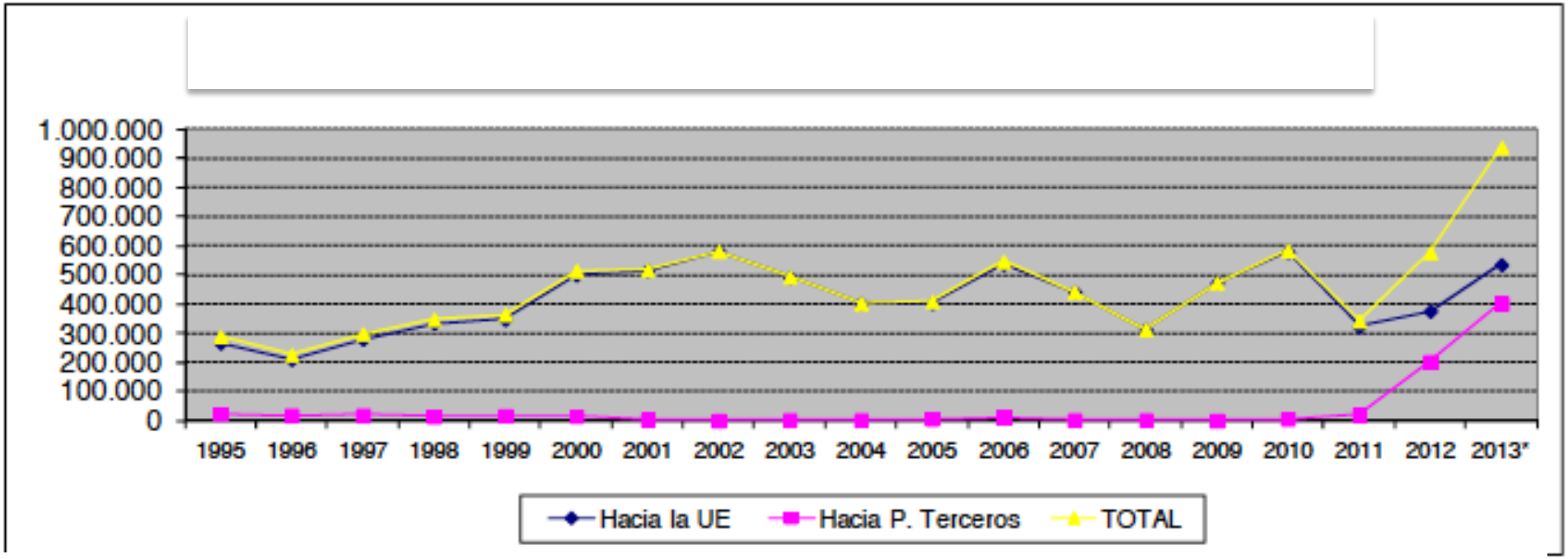
Dairy goats local breeds

FEAGAS WEBSITE

MAJORERA (CANARY ISLANDS).

NEGRA SERRANA.

Exporting genetic resources, live animals / year



Los principales destinos de exportación de animales vivos ovinos y caprinos son Francia (37%), Portugal, (47%), Libia (20%), Italia (13%) y Líbano (3%).

CABRANDALUCIA:
FEDERATION OF GOATS BREEDS ASSOCIATIONS
IN ANDALUSIA (from 2005)

CAPRIGRAN
Asociación Nacional de Criadores de Caprino de Raza Murciano-Granadina

Cabra Malagueña

acriflor
asociación de criadores de cabra florida

Asociación de criadores de Raza Caprina
Payoya

ABLANSE

ANCCA

CABRANDALUCIA:
FEDERATION OF GOATS BREEDS ASSOCIATIONS IN ANDALUSIA (from 2005)

- **94.407 goats**
- 11% of total Andalucía

- **282 farms**

- **100% of animals in breeding programs**

- **Six breeds**

AREAS OF WORK

LACTATION COTROL PROGRAMME

Centro de Referencia Caprino

GOAT REFERENCE CENTER

1. Lactation control programme

Monthly individual collection of production data and milk samples

2. Goat reference center

OBJECTIVE : organize the sector to make it more competitive

ACTIVITIES:

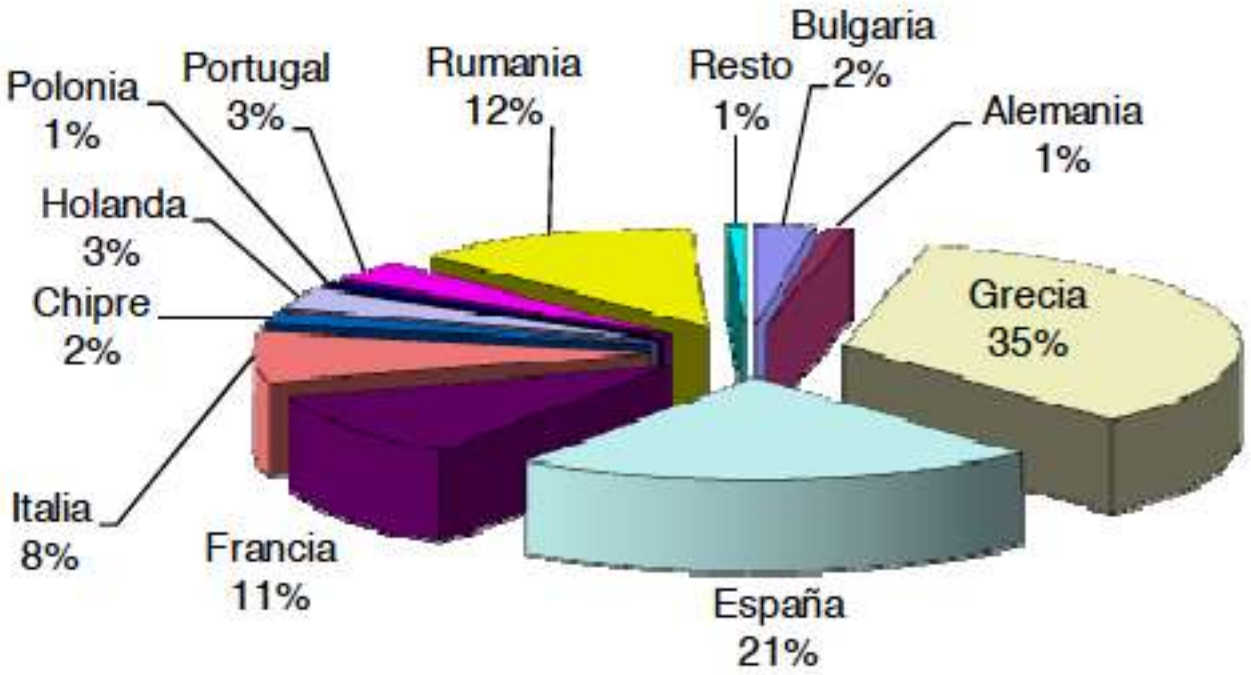
COURSES AND PRACTICAL TRAINING

RESEARCH

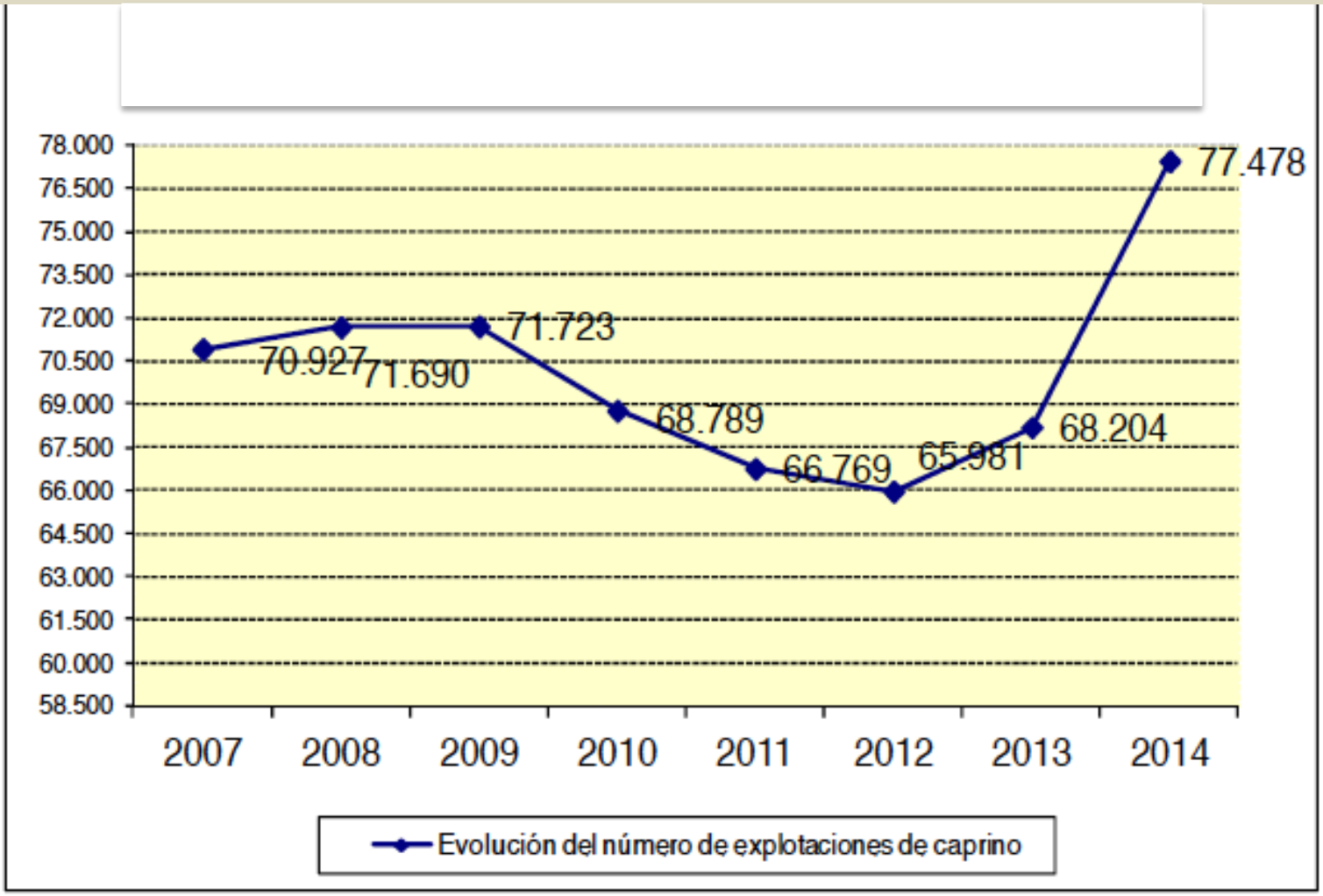
Centro de Referencia Caprino

MARKETING

Distribution by countries EU, goats population



Goats farm numbers in Spain



EU goat milk production

Table 5 Goat milk production in the main EU producting countries, 1999-2009

Country	1999		2009		2009/1999
	Metric Tons	%	Metric Tons	%	%
Bulgaria	200,000	10.57	64,090	3.28	32.04
Czech Rep.	15,154	0.80	8,652	0.44	57.09
Estonia	549	0.02	477	0.02	86.88
France	495,800	26.21	623,460	31.92	125.74
Greece	526,142	27.82	505,000	25.86	95.98
Hungary	4,165	0.22	3,200	0.16	76.83
Italy	114,400	6.04	46,000	2.35	40.20
Latvia	1,726	0.09	3,392	0.17	196.52
Lithuania	12,320	0.65	4,063	0.20	32.97
Malta	277	0.01	1,296	0.06	467.87
Portugal	34,393	1.81	26,877	1.37	78.14
Romania	126,360	6.68	183,346	9.38	145.09
Slovakia	13,200	0.69	8,200	0.41	62.12
Slovenia	2,160	0.11	1,539	0.08	71.25
Spain	404,100	21.37	473,000	24.30	117.05
Total EU	1,890,923	100.00	1,952,592	100.00	103.26

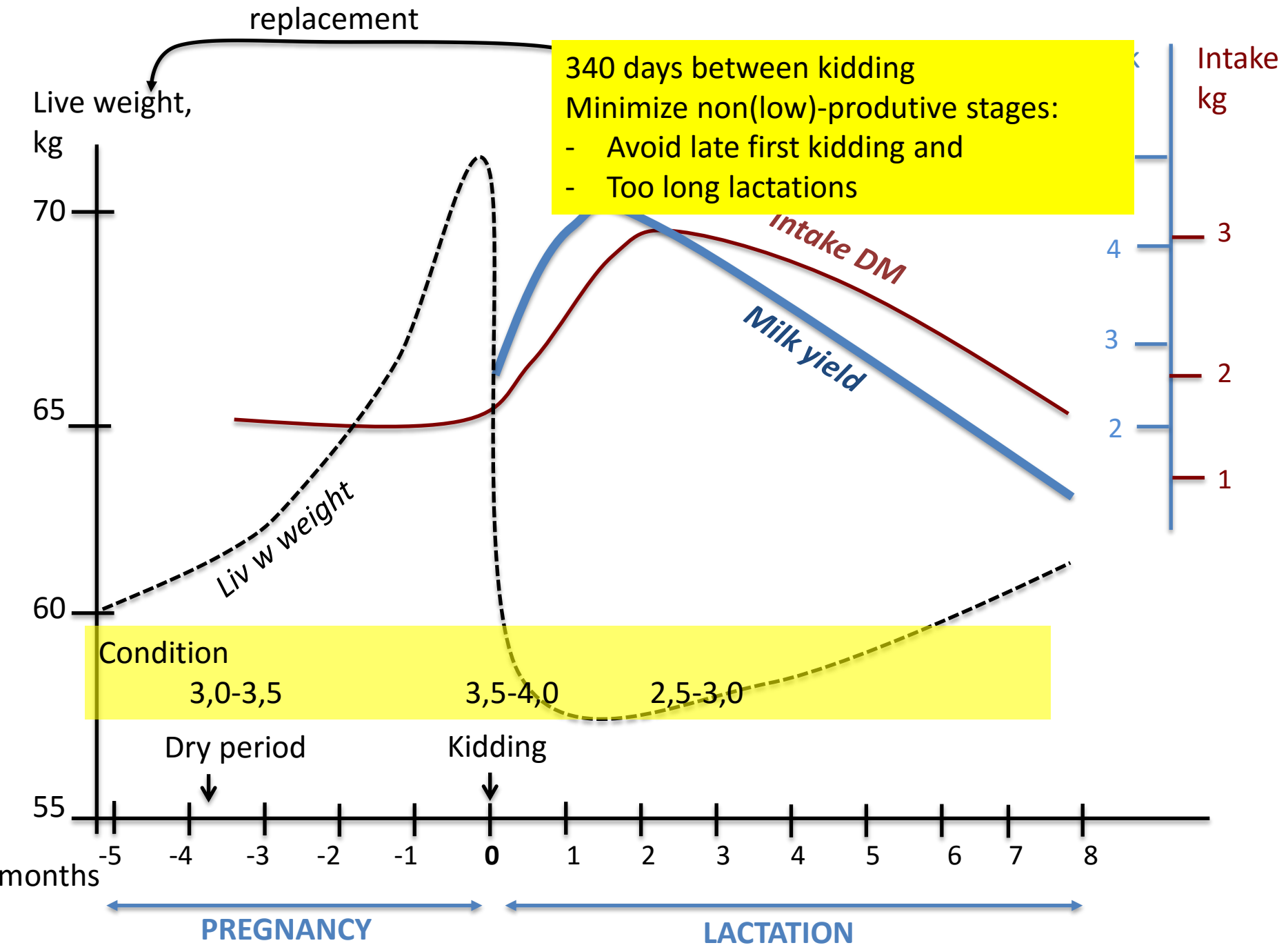
Source:FAOStat, 2010, [12].Own calculations

Distribution by continents

Table 4 Distribution of goat milk production by continent, 1999-2009

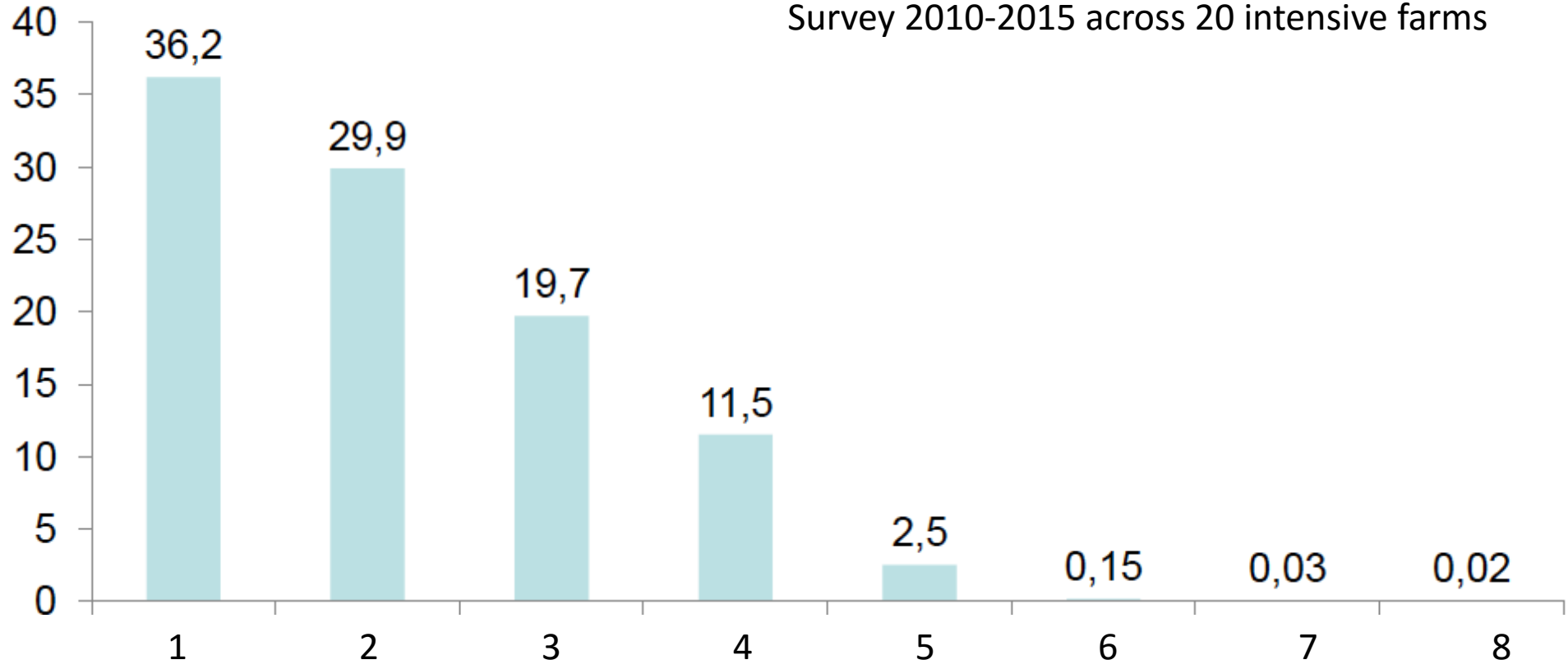
Year	MU	Asia	Africa	Americas	Europe	Oceania	Total world
1999	1,000 MT	7,011	2,615	555	2,476	0.027	12,657
	%	55.39	20.66	4.38	19.56	0.01	100.00
2009	1,000 MT	8,909	3,206	544	2,469	0.040	15,128
	%	58.89	21.19	3.59	16.32	0.01	100.00
2009/1999	%	127.07	122.60	98.01	99.71	148.14	119.52

Source:FAOStat, 2010, Own calculations.

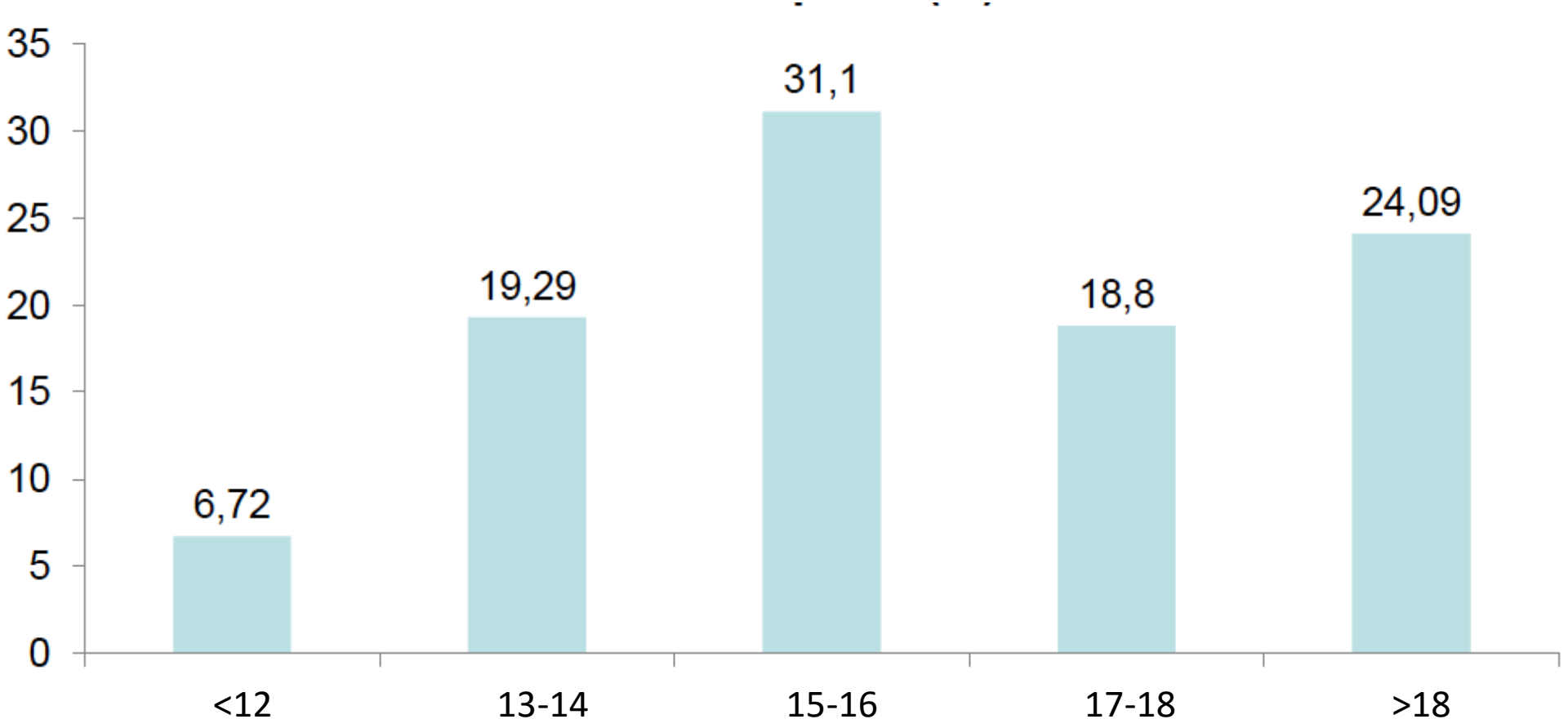

replacement
340 days between kidding
Minimize non(low)-produtive stages:
- Avoid late first kidding and
- Too long lactations
Live weight, kg
70
65
60
55
Intake kg
4
3
2
3
2
1
Intake DM
Milk yield
Liv w weight
Condition
3,0-3,5
3,5-4,0
2,5-3,0
Dry period
Kidding
-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
months
PREGNANCY
LACTATION

Number of lactation / goat (% goats)

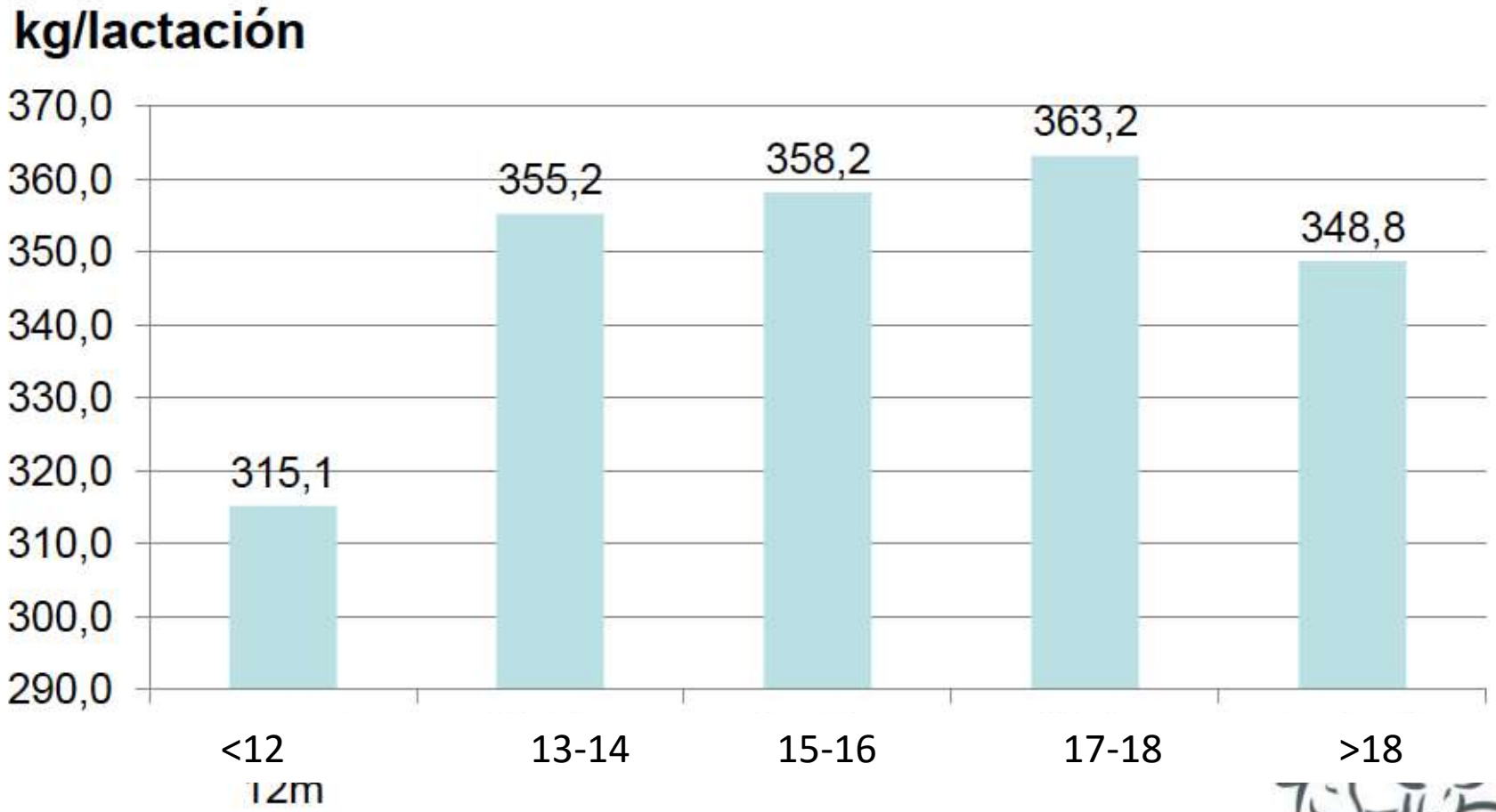
Survey 2010-2015 across 20 intensive farms



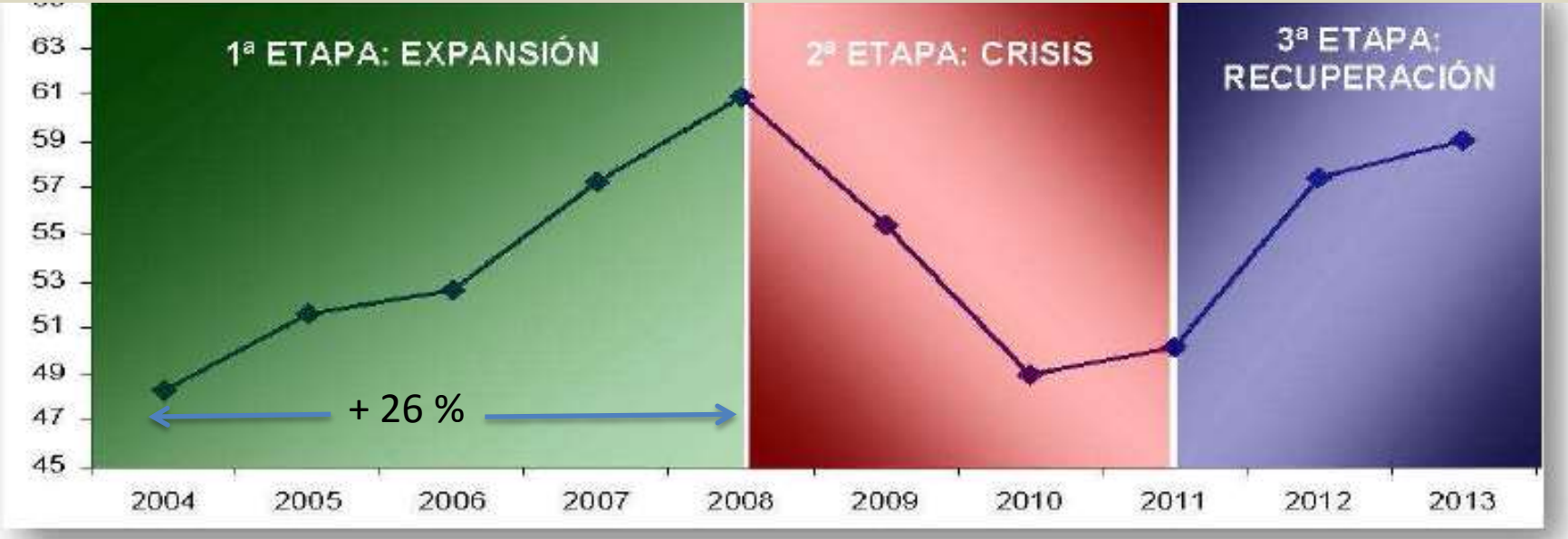
Age 1st kidding (% goats)



Milk production according to 1st kidding



Goat milk prices last 10 years



- Increased demand in EU, hardly any competition from outside EU
- Increased demand from consumers

- Increased production costs
- Increased flocks size and intensification

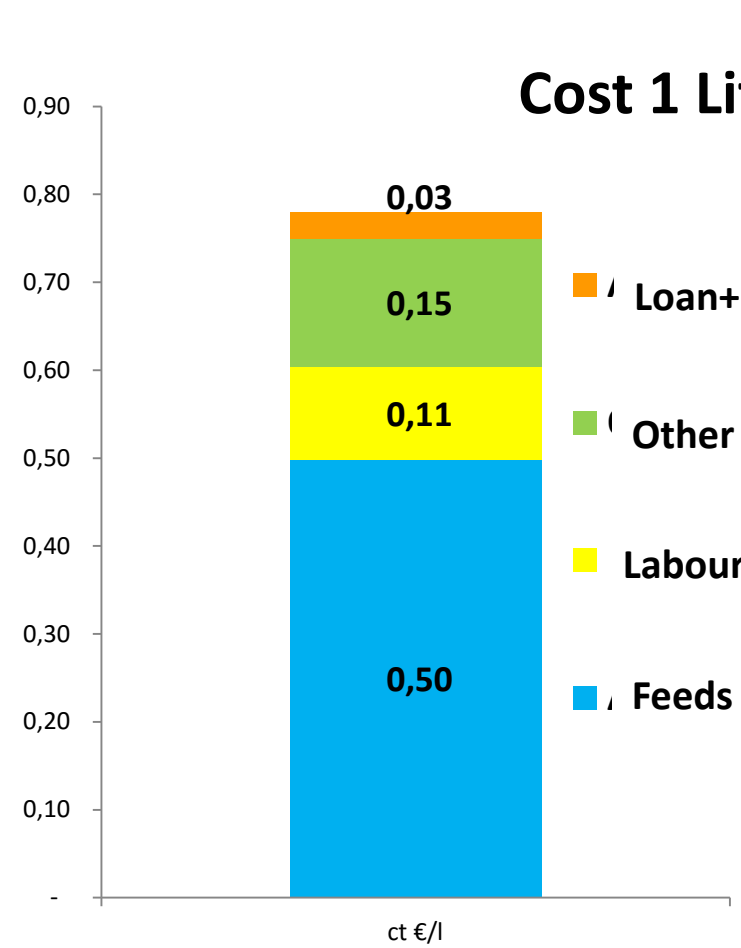
- Excessed production
- International competitors
- Decreased demand
- Financia crisis

- Higher presure from industry
- Increased production costs

- New markets (China)
- Traditional markets recovered
- Reduced production
- Still high production costs

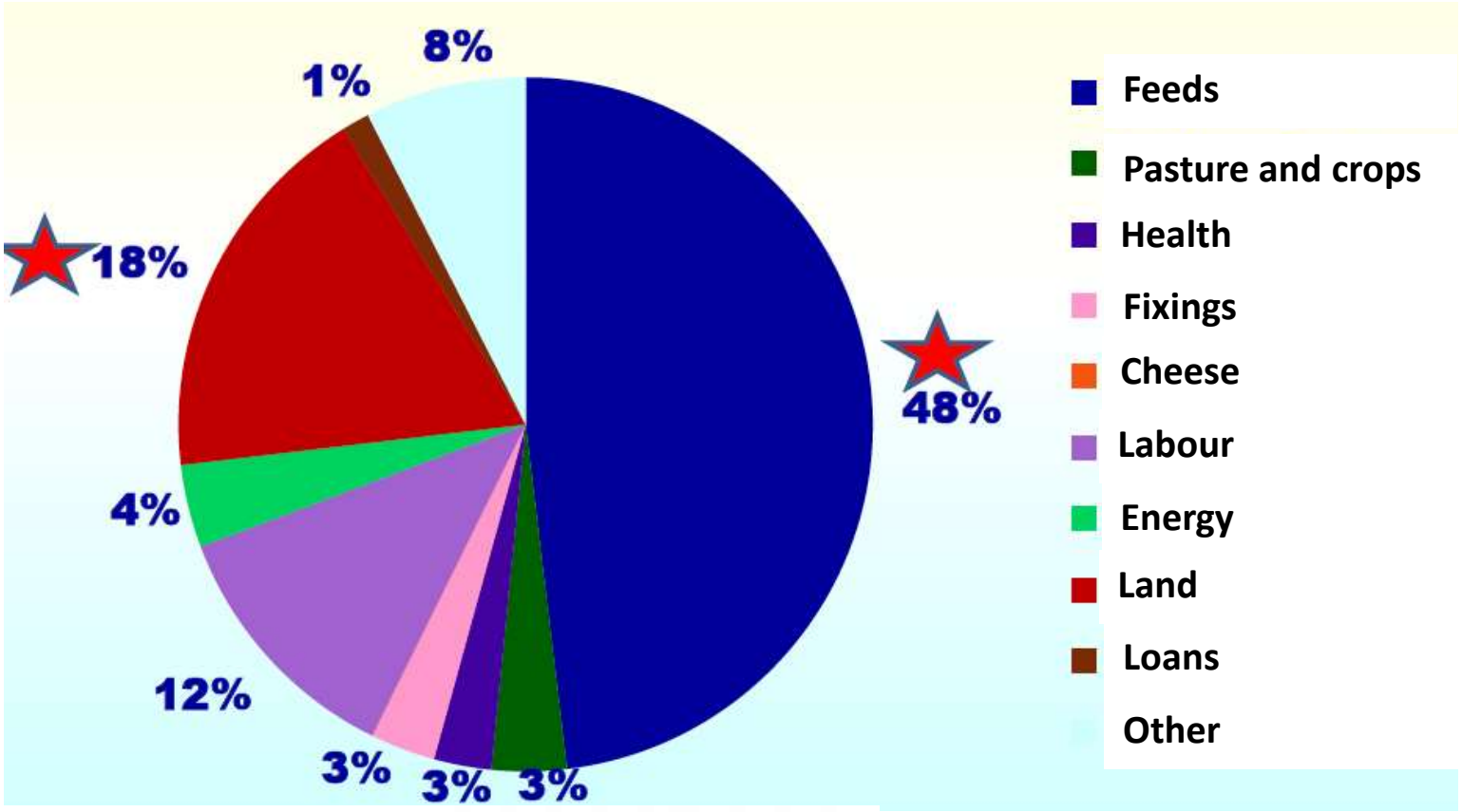
Farm costs for 1 litre milk INTENSIVE (10 farms)

149 € / goat /year



Farm costs for 1 l milk (SEMI)EXTENSIVE (12 farms)

114 € / goat /year



Agro-industrial by-products

Olive oil industry

Greenhouse horticulture

Olive pulp

Olive leaves

Tomato waste

	Olive pulp	Olive leaves	Tomato waste
			
CP	7,44	9,88	15,3
NDF	63,2	41,8	19,1
ADF	43,0	28,2	13,9
Fat	0-6	4-8	4,8
Water	60	42,1	94

How to store and provide these feeds?

-Fresh?

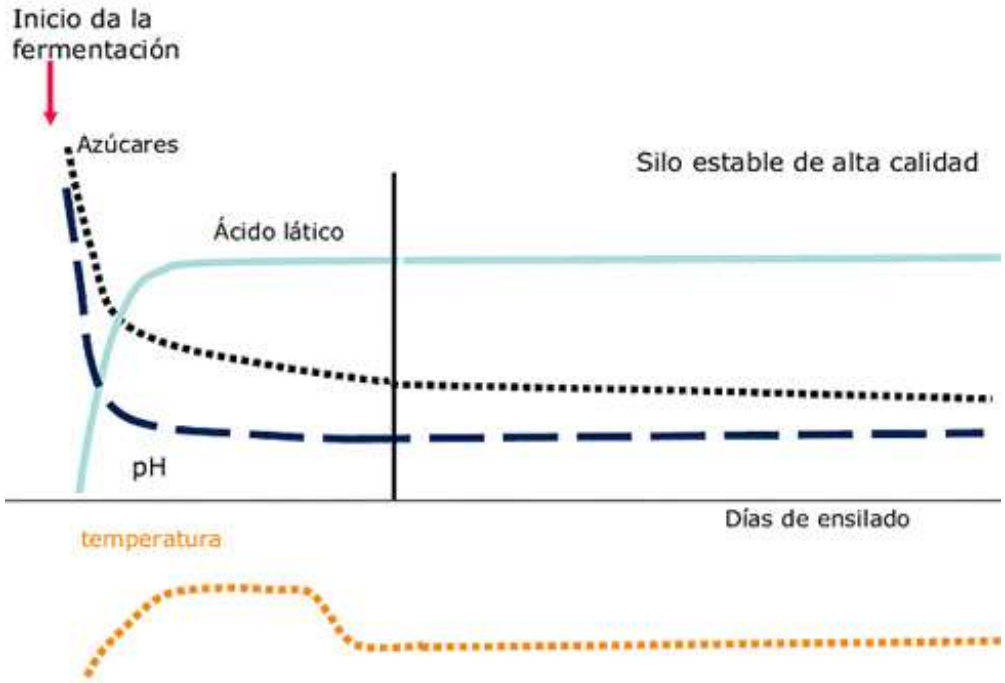
-BLOCKS

SOLID | Sustainable Organic and Low Input Dairying

-SILAGE

ENSILING

40-60 % H2O
SUGARS



OLIVE SILAGE: 50 % olive leaves+ 25 % olive pulp+ 25 % barley

TOMATO SILAGE: 80 % tomato + 15 % straw+ 5 % barley+ formic acid

Video ensilado

On-farm trials in Spain: *by-products in dairy goats*

Farm 1 (*September-November 2013*)

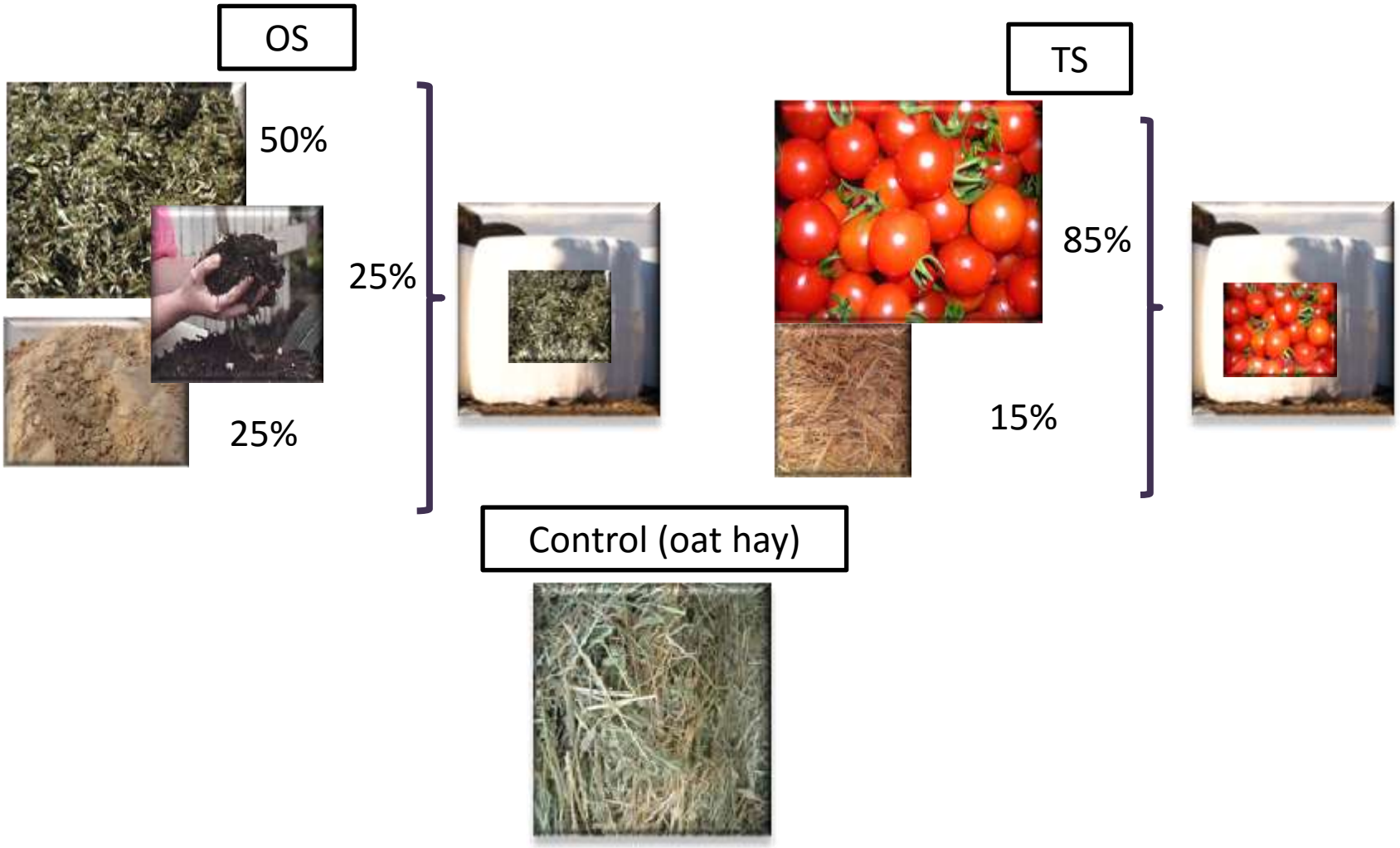
- Olive and tomato silages
- 3 experimental groups

  Control : olive silage : tomato silage
- 2 months monitoring
- Feed intake, milk yield and composition and environmental assessment

Farms 2 and 3 (*September-December 2013*)

- Orange (farm2) and cauliflower (farm3) by-products
- 260 (1) and 600 (2) lactating goats
- 4 months monitoring
- Feed intake, milk yield and composition, farm inputs and outputs

Farm 1: Silages made with olive oil and tomato by products



Farm 1: Silages made with olive oil and tomato by products

	Olive silage	Tomato silage	Oat Hay
DM (%)	71,4	41,6	92,6
OM (%)	83,7	89,7	95,8
Ee (%)	5,95	3,16	4,8
NDF(%)	39,0	41,6	34,4
CP (%)	8,8	11,9	10,1

60 dairy goats in mid lactation
(n=20) (groups of 5)

TMR (80%) + 20% Oat hay
Olive Silage
Tomato Silage

9 % feeding costs

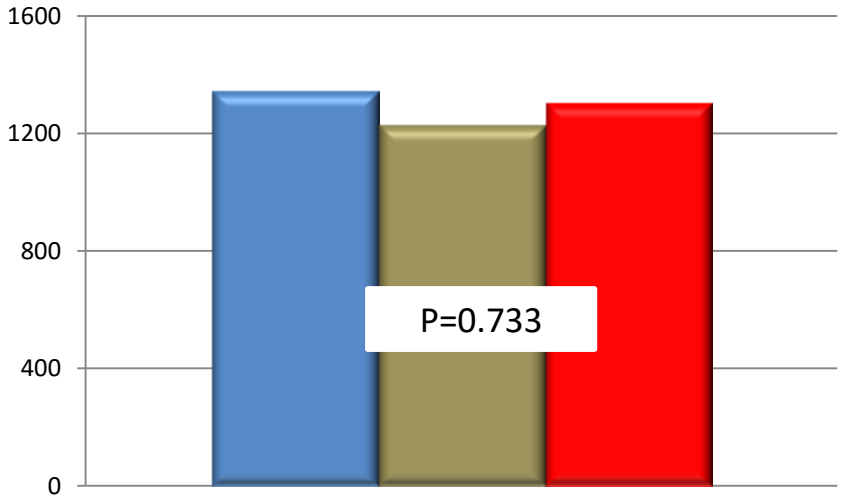
28 days
adaptation

- Milk yield (2 d) and composition
- Intakes (5 d by groups)
- Rumen digesta

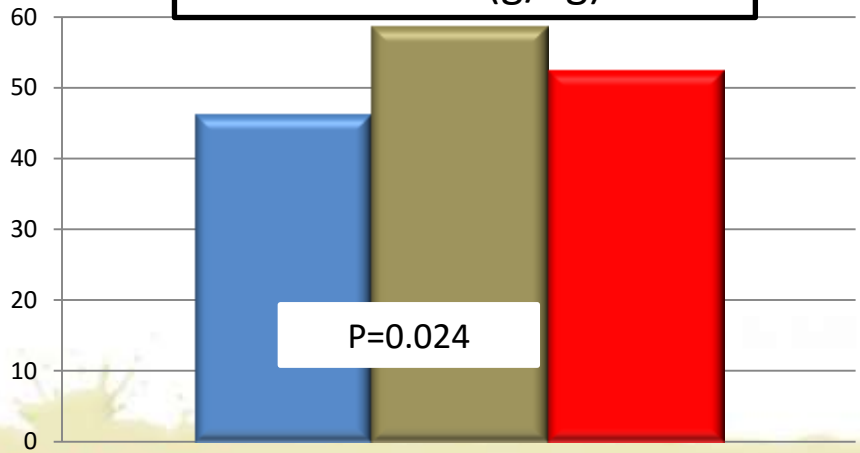
Control Olive silage Tomato silage

Daily intakes(g/d DM)

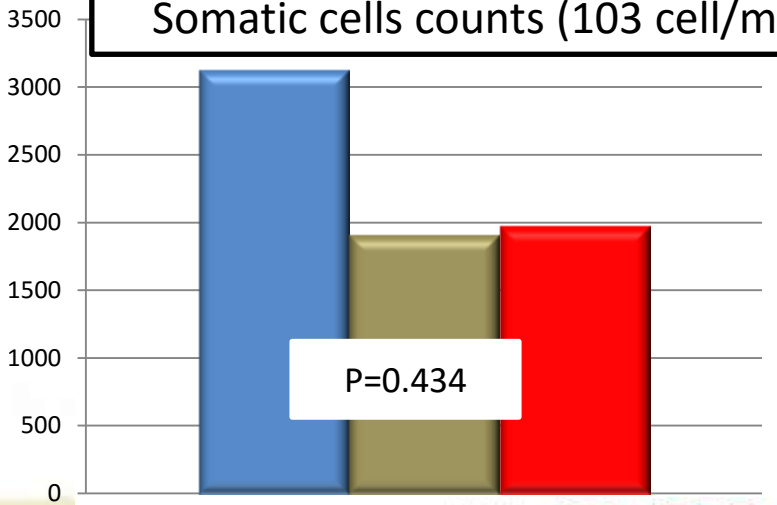
Milk yiled (g/d)



Milk fat (g/kg)



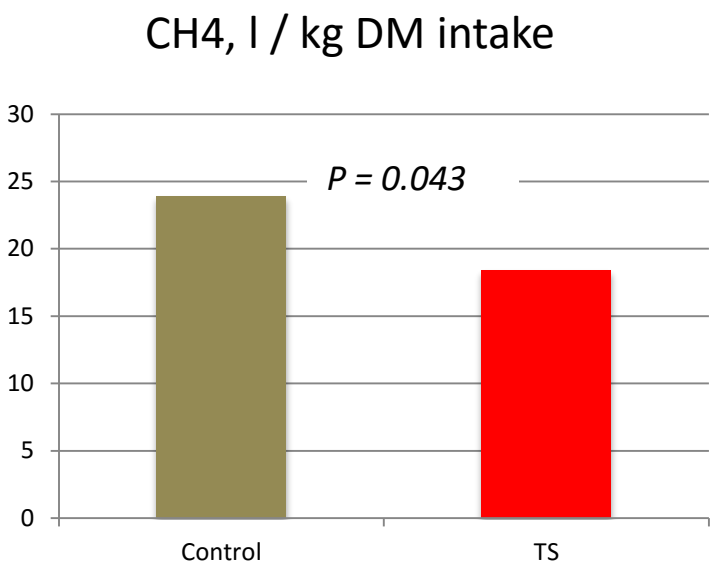
Somatic cells counts (103 cell/ml)



SOLID | Sustainable Organic and Low Input Dairying

CSIC
Consejo Superior de Investigaciones Científicas

Farm 1: Silages made with olive oil and tomato by products



Advances in Animal Biosciences (2015), **6:1**, pp 40–42 © The Animal Consortium 2015
doi:10.1017/S204047001400051X

advances in animal biosciences

Modelling the impact on greenhouse gas emissions of using underutilized feed resources in dairy goat systems

G. Pardo[1†], D. Yañez-Ruiz[2], I. Martin-Garcia[2], A. Arco[2], R. Moral[3] and A. del Prado[1]

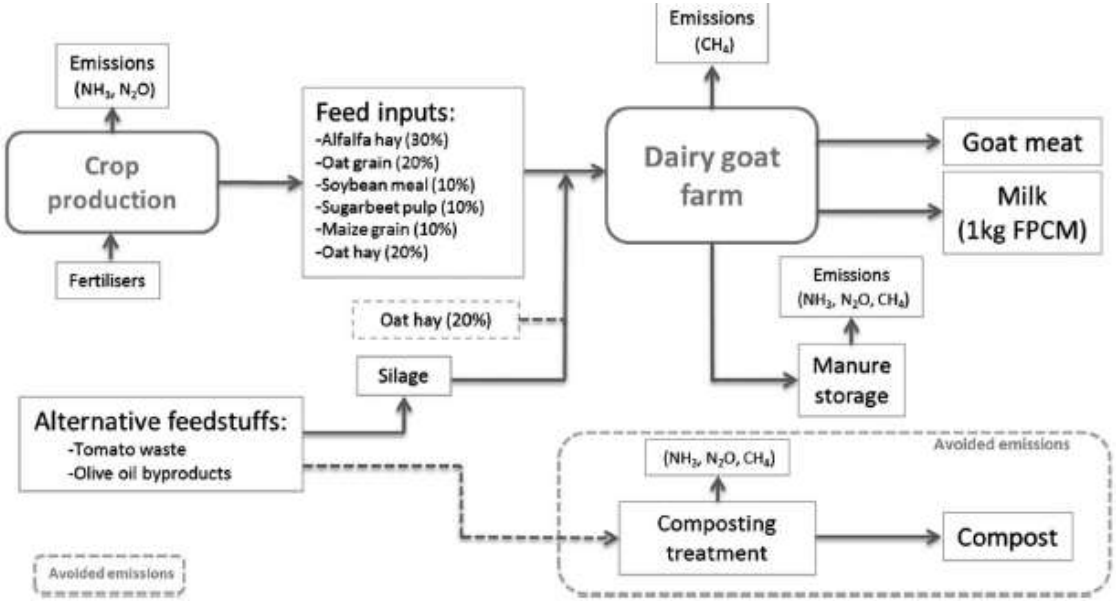
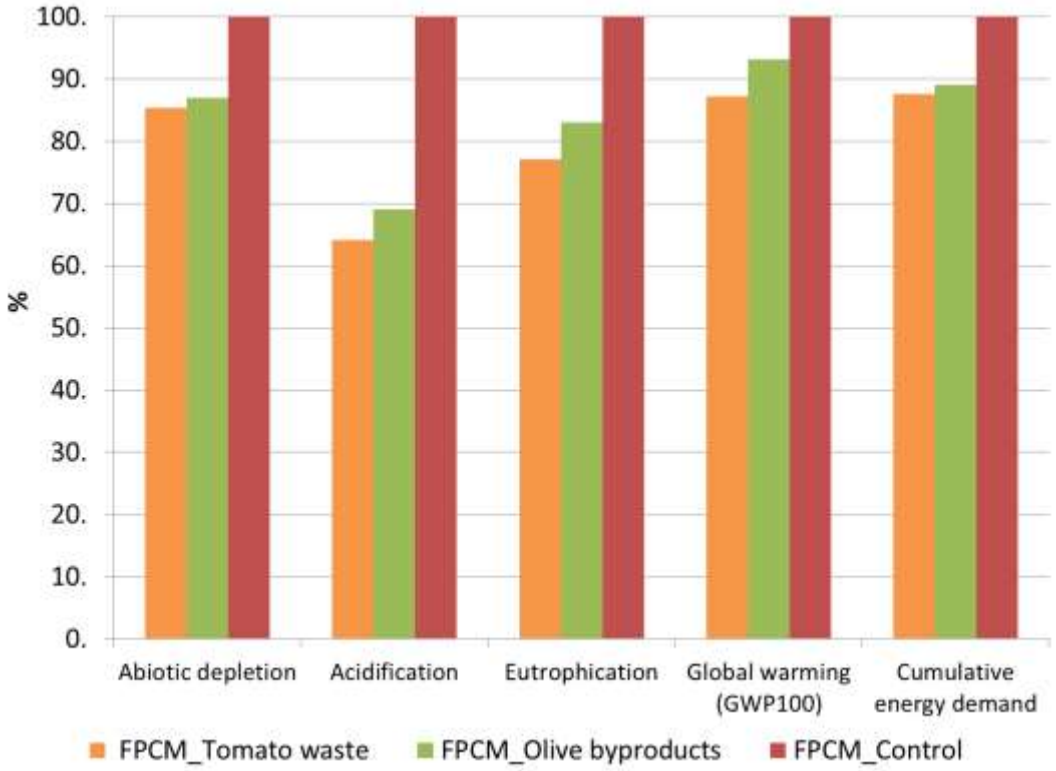


Figure 1 Modelling framework for dairy goat production system.

Results

- Impact assessment:



Farm 1: Silages made with olive oil and tomato by products

Pesticides

detecded in silages and diets
GCMS/MS & LCMS/MS

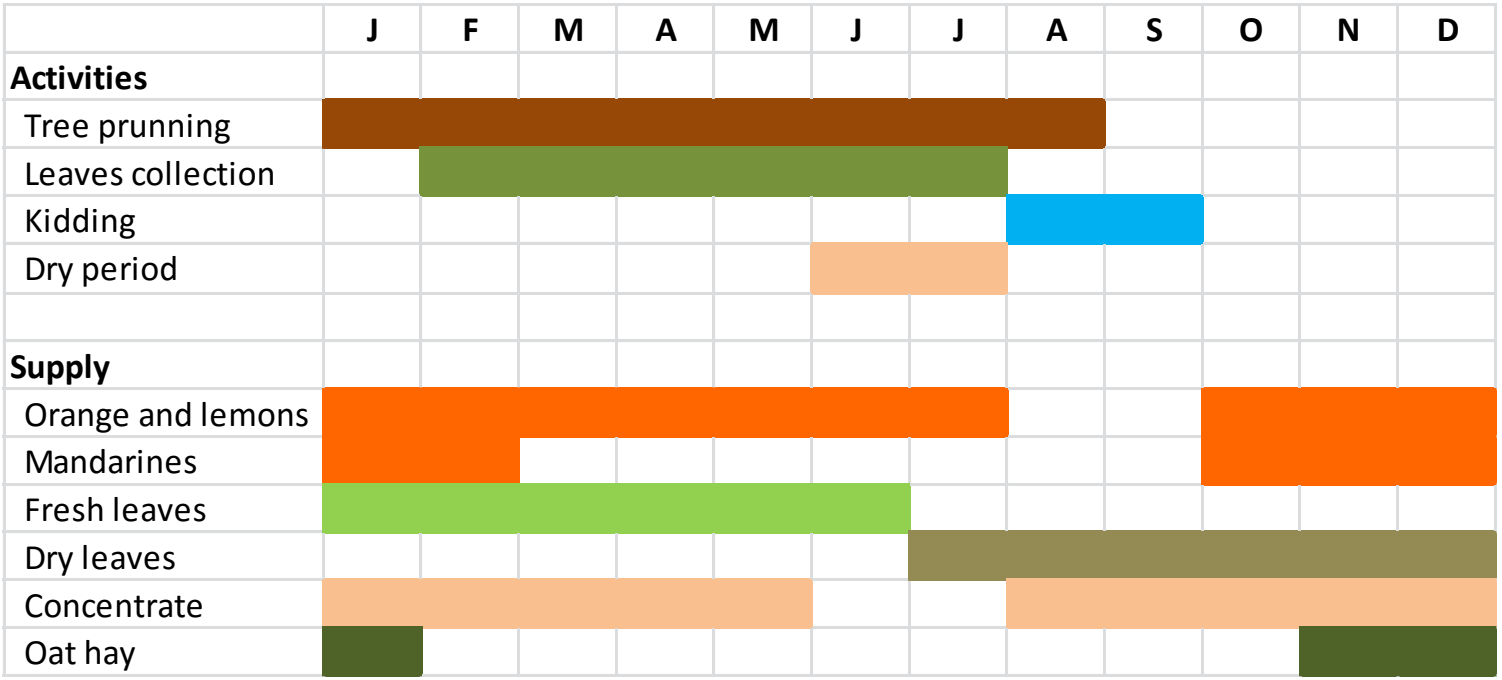
*10 µg/kg, *EUPT-CF7 2014*".
<LD: below detection level
; N.D.: non detected

Pesticides (µg/kg)	OE	Diet OE	TS	Diet TS	Control
2-Fenil-fenol[1]	13,5*	15,0*	17,0*	20,3*	16,4*
Acetamiprid[2]	11,5*	1,70	9,30	N.D.	0,40
Azinfos-etil[2]	N.D.	N.D.	14,1*	N.D.	N.D.
Azoxistrobina[2]	44,0*	<LD	24,5*	<LD	N.D.
Carbofurano[2]	N.D.	N.D.	15,0*	N.D.	N.D.
Carboxin[2]	4,50	N.D.	<LD	<LD	<LD
Clorpirifos[1]	11,4	111*	7,90	109*	126*
Clorpirifos metil[1]	N.D.	13,1*	N.D.	11,3*	N.D.
Clotianidina[2]	N.D.	N.D.	4,20	N.D.	N.D.
Cipermetrina[1]	N.D.	131*	N.D.	95,7*	90,5*
Ciprodinilo[1]	N.D.	N.D.	92,4*	19,3*	N.D.
Difenoconazol[2]	<LD	<LD	25,2*	<LD	<LD
Diflufenican[1]	11,5*	7,00	N.D.	N.D.	N.D.
Epoxiconazol[2]	<LD	<LD	30,0*	<LD	<LD
Espiroxamina[2]	<LD	<LD	12,2*	<LD	<LD
Etofenprox[1]	N.D.	39,2*	41,5*	28,5*	24,2*
Fenhexamida[2]	<LD	<LD	16,5*	<LD	<LD
Fenitrotión[2]	N.D.	N.D.	3,60	N.D.	N.D.
Fenpropimorf[2]	N.D.	N.D.	3,00	<LD	N.D.
Fention-sulfona[2]	6,60	N.D.	2,70	N.D.	N.D.
Fention-sulfoxido[2]	N.D.	N.D.	12,5*	N.D.	N.D.
Fludioxonil[1]	N.D.	N.D.	130*	38,1*	N.D.
Fluquinconazol[2]	N.D.	N.D.	18,0*	N.D.	N.D.
Flutriafol[2]	<LD	<LD	39,0*	2,10	<LD
Fosfamidón[2]	N.D.	N.D.	12,3*	N.D.	N.D.
Imazalil[2]	N.D.	N.D.	12,0*	N.D.	N.D.
Iprodiona[2]	<LD	<LD	18,6*	<LD	<LD
Isoproturón[2]	N.D.	N.D.	11,7*	<LD	N.D.
Linurón[2]	N.D.	N.D.	12,3*	N.D.	N.D.
Malaoxón[2]	2,50	2,90	6,50	N.D.	N.D.
Malatión[2]	<LD	<LD	14,4*	<LD	<LD
Metconazol[2]	<LD	<LD	32,1*	<LD	<LD
Metacrifos[2]	21,2*	N.D.	4,50	N.D.	N.D.
Oxifluorfen[1]	359*	93,3*	18,3*	N.D.	N.D.
Paclobutrazol[2]	<LD	N.D.	38,7*	<LD	<LD
Pencicurón[2]	<LD	<LD	12,0*	N.D.	N.D.
Pirimifos metilo[1]	N.D.	11,5*	N.D.	9,60	10,7*
Piraclostrobina[2]	N.D.	N.D.	<LD	N.D.	N.D.
Pirimetanil[1]	N.D.	N.D.	27,4*	12,6*	10,2*
Quinoxifen[2]	<LD	<LD	14,1*	<LD	<LD
Tebuconazol[2]	14,5*	239*	68,1*	289*	161*

Farm 2: Citric by-products in dairy goats

Farm 2: Citric by-products in dairy goats

Yearly farm calendar of activities and feeds supply



Farm 2: Citric by-products in dairy goats

	DM (g/kg)	OM	CP	NDF	ME (MJ/kg DM)
Oranges	415	960	85	127	6.45
Mandarines	154	960	62	154	6.29
Lemons	110	958	73	97	6.15
Fresh leaves	370	872	172	177	5.45
Dry leaves	916	812	125	285	4.48
Concentrate	855	951	176	212	9.98
Oat hay	908	924	53	330	6.25
Barley straw	939	970	17	433	5.22

Declaración de Control

Asociación Nacional de Criadores de Caprino de Raza Murciano Granadina

Caserío San Pedro s/n - 18220 Albolote (Granada) - Tfno/Fax: 958467558 - E-mail: caprigran@terra.es

F. Control	26/01/2013	Método	AT4T	Horas	16:45 - 22:00
F. Entrada	28/01/2013	F. Análisis	29/01/2013		
Control ID	G040GFG0113DA	Total 24 H	335,92		
Cod. Lechero	G040GFG	Controlador/a	04001		
Medida	KG - KILOGRAMOS	Raza	M-GRANADINA		
Explotación	ISABEL Mª FLORES GALLARDO				
Localidad	VERA, ALMERIA				

GFG

Incidencias Control

[ ] 0 - CONTROL POSTERIOR A VACACIONES
[ ] 1 - CAMBIO EN ALIMENTACIÓN DEL REBAÑO
[ ] 2 - ALTERACIÓN EN ORDEÑO ANTERIOR
[ ] 3 - ALTERACIÓN POR MANEJO
[ ] 4 - OXITOCINA COLECTIVA

RESUMEN COMPARATIVO DEL CONTROL

CONTROL REALIZADO EL 26/01/2013

Nº ANIMALES	Kg. CONTROL	Kg. TANQUE	Kg. x ANIMAL	CSS CON.	CSS TAN.
186	349,6	335,9	1,88	829	1025

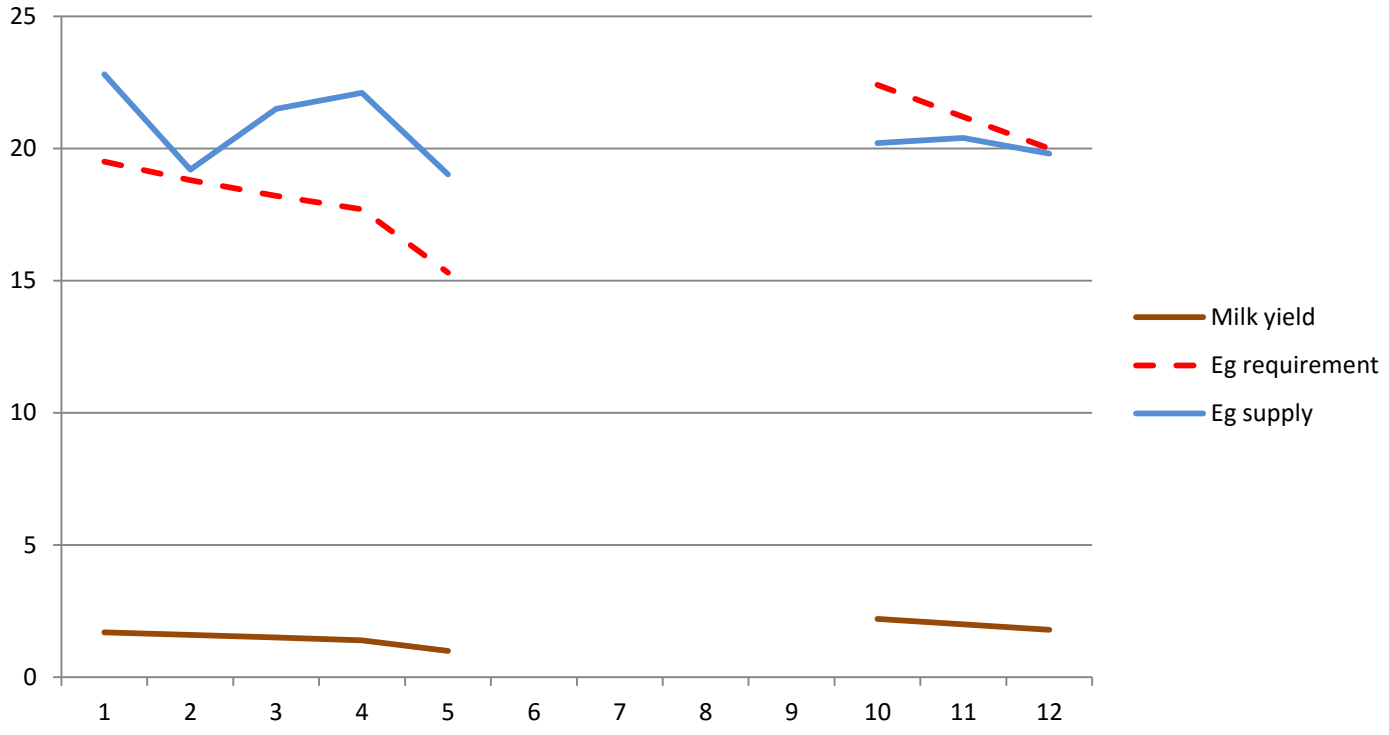
CONTROL ANTERIOR

Nº ANIMALES	Kg. CONTROL	Kg. TANQUE	Kg. x ANIMAL	CSS CON.	CSS TAN.
193	298,8	299,3	1,55	596	881

MEDIA ASOCIACIÓN	2,00
MEDIA AUTONÓMICA	1,94
MEDIA PROVINCIAL	2,04
MEDIA ASOCIACIÓN	1336
MEDIA AUTONÓMICA	1161
MEDIA PROVINCIAL	1088

DR	Animal	Pa	F. Parto	NP	NC	DEL	Incidencias	Kg	Kg²	% Gr	% Pr	ESU	ACS	CSS	Acum	Pr. 305	Vitalicio
75	17500x	1	00/00/0000					2,23	1,1	6,0	3,3	9,3	0	206			
58	GFG05038 | 17278	1	28/12/2012	6	1	29	6	1,02	0,5	5,0	3,4	8,4	0	86	14,7		2827,6
62	GFG07002 | 17295	1	26/11/2012	7	2	61		2,64	1,3	5,7	3,7	9,4	73	180	101,3		2027,4
78	GFG07035 | 17608	1	29/11/2012	7	2	58		2,23	1,1	6,4	3,6	10,0	1237	1145	71,2		1791,4
61	GFG09001 | 17390	1	27/11/2012	4	2	60		2,23	1,1	5,4	4,2	9,5	0	952	34,6		732,8
77	GFG09008 | 17283	1	29/11/2012	4	2	58		2,64	1,3	5,2	3,5	8,7	0	1173	51,3		851,9
11	GFG09013 | 17293	1	01/12/2012	4	2	56		1,62	0,8	5,3	3,2	8,5	0	624	25,2		773,7
70	GFG09018 | 17319	1	29/11/2012	4	2	58		2,44	1,2	4,9	3,2	8,2	0	76	37,8		761,2

Farm 2: Citric by-products in dairy goats



New by-product: water melon plant

Conclusions

- Well organised sector but very much dependent on
  - Acquiring external feeds
  - Milk price

- Use of by-products locally may alleviate the high dependence on external feeds input

ευχαριστώ

Thank you!

david.yanez@eez.csic.es