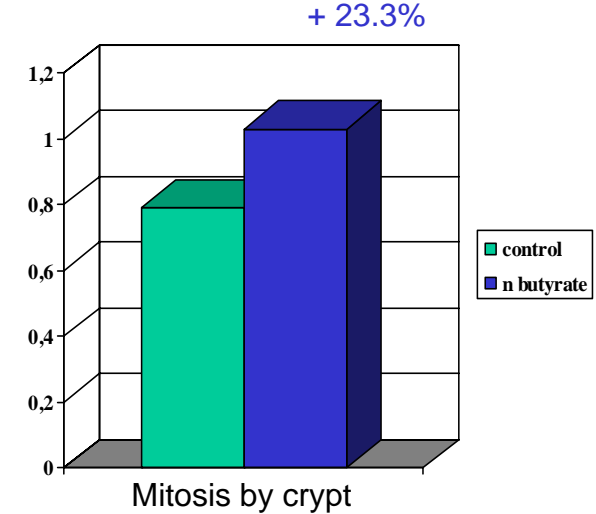
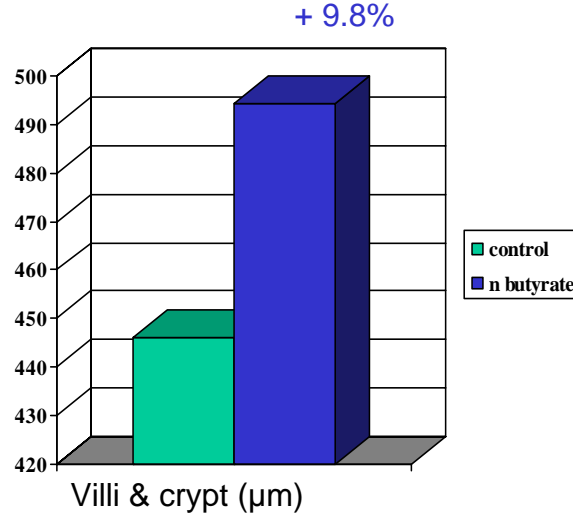
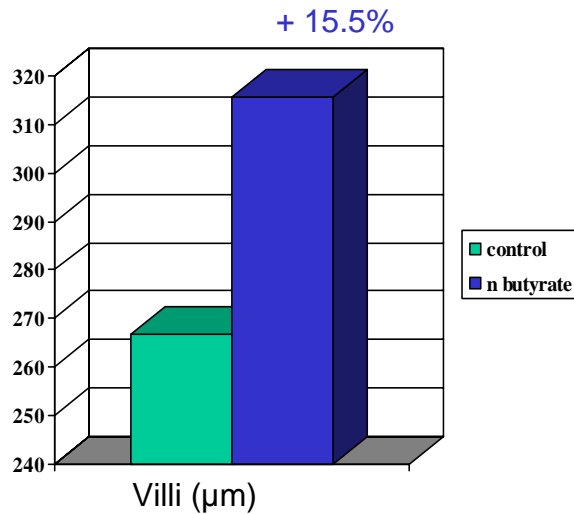


**Effect on villi: Integrity of digestive mucous ...surface of absorption...**

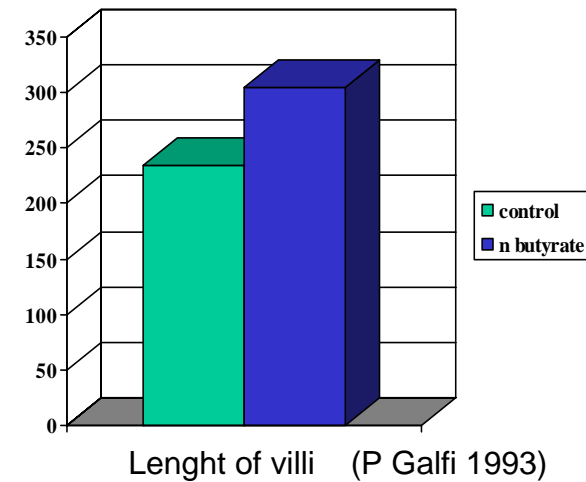
Effect on the intestinal wall (jejunum)(P Galfi 1993)



Result of incorporation of VFA C4  
In a feed from 31 days to slaughtering.

Length of villi	control	C4 VFA
	234.0 ± 25.5	304.4 ± 15.0

**Length of intestinal villi increases in 30.1%**



## Comparative test: C4 VFA double buffer( 54%) / sodium butyrate not buffered (95%)

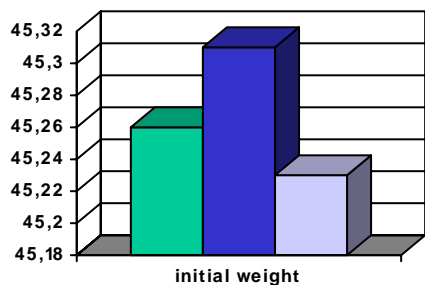
Test carried out in Spain September 1999, ref test PS 28 (Mr Antonio Flores)

Animals broiler male Hybro-G

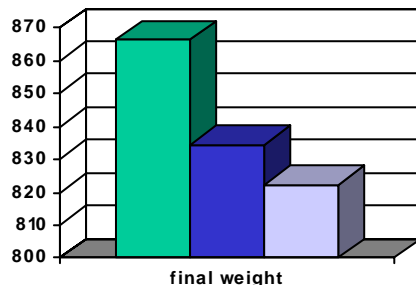
24 chicks by box / 10 repetitions : total 720 chicks tested.

Time of test from 0 to 21 days of age

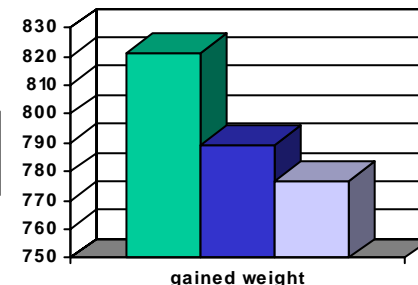
Feed first age 3050 cal/kg + GP 4 ppm flavomycine + 50 ppm narasin & 50 ppm nicarbazine



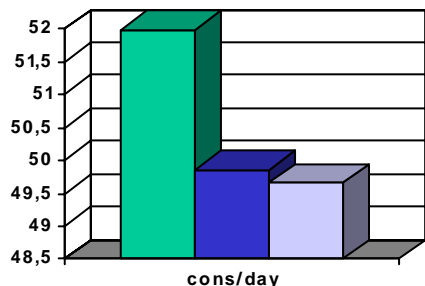
Coef variation 0,61  
Average 45,26  
Res stat NS



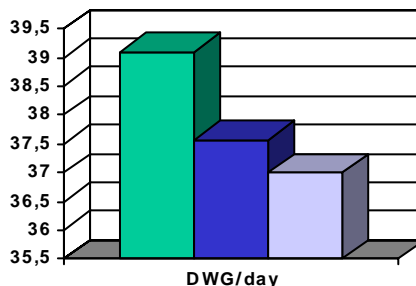
Coef variation 3,10  
Average 841,0  
Res stat 0,008



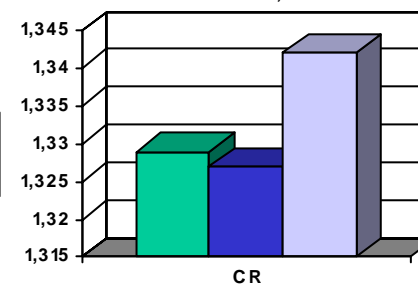
Coef variation 3,28  
Average 795,73  
Res stat 0,008



Coef variation 2,65  
Average 50,50  
Res stat 0,003



Coef variation 3,28  
Average 37,89  
Res stat 0,008



Coef variation 1,72  
Average 1,333  
Res stat NS

**Conclusion :** C4 VFA (54% de sodium butyrate compared to two products not buffered (95% sodium butyrate)

Increases the consumption from 2.12 to 2.31 g/day (it means + 4.25% and 4.65%)

Increases the gain of weight + 31.95 g and 44.03 g (it means + 4.05% and 5.66%) without difference on the IC.

(The No buffered Sodium Butyrate loses its efficacy because of a rapid dissociation )

## C4 VFA: effect on the villi...

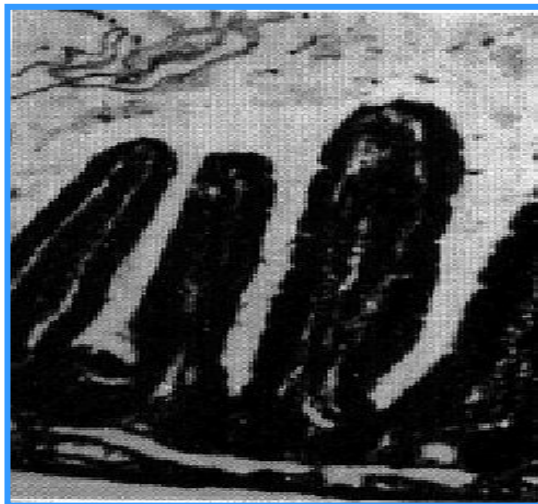
Histological cuts of samples of ileum taken from pigs (Galfi 1993)

Results of the addition of  
C4 VFA to a feed

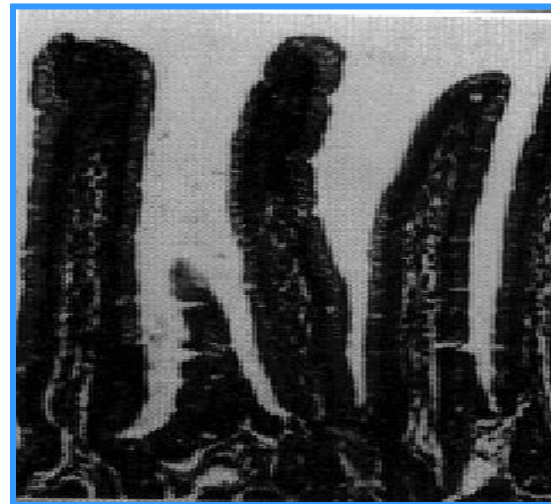
The pigs were fed with the experimental  
feed from the  
30<sup>th</sup> day of life to death.

	Control	+ C4 VFA 1.5 kg/T
Length of the intestinal villa ( $\mu\text{m}$ )	234.0 +/- 25.5	304.4 +/- 15.0

→ The length of the intestinal **VILLI** increases in **30.1%**



Control



+ C4 VFA

## Stimulation of intestinal enzymes...

Study carried out on 2 batches of piglets weaned at 21 days

Use of 100mg/D from D0 to D3

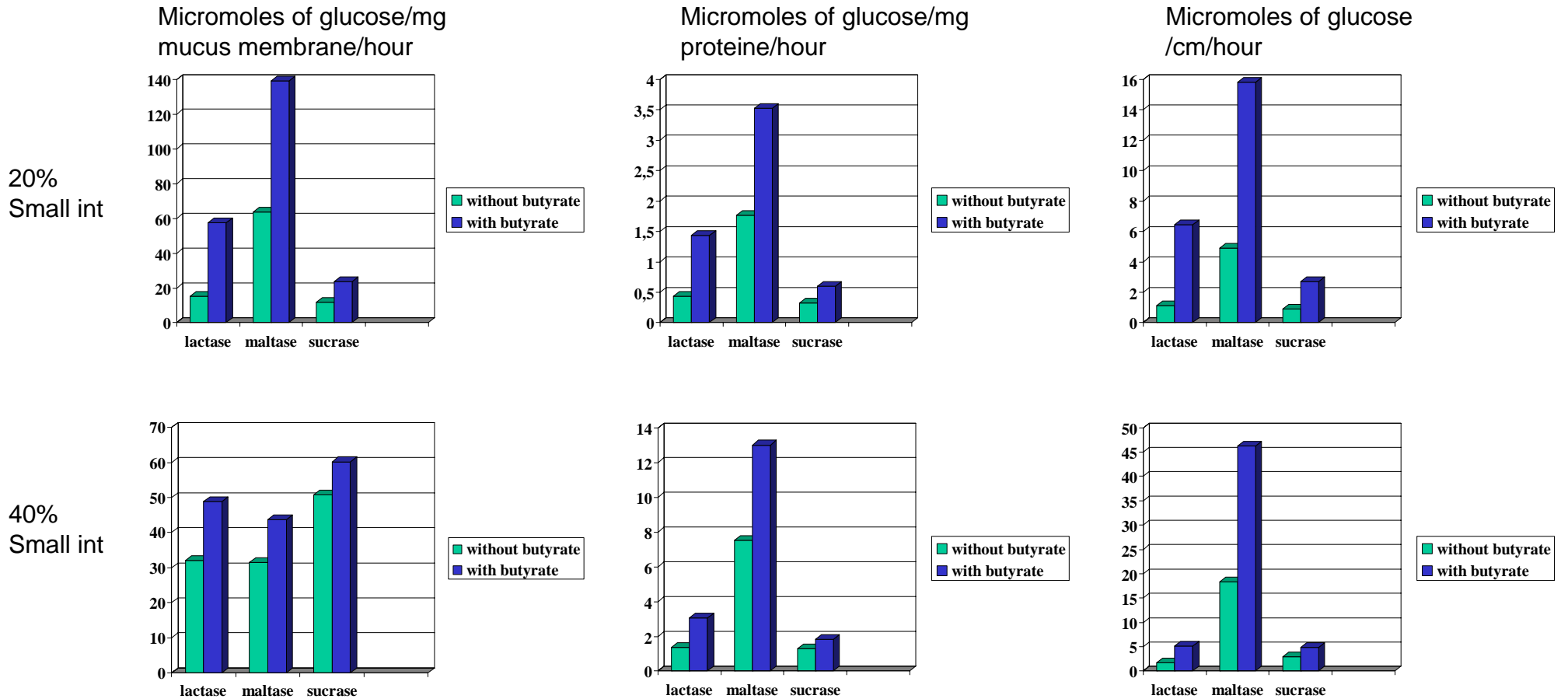
200mg/D from D4 to D6

Study for Unilever of:

Fletcher, Newbold, Butler 1991

	Without butyrate	With butyrate
Initial weight	6.2 Kg	6.1 Kg
Weight at D6	6.6 Kg	7.3 Kg

## Control of enzymatic activity after slaughtering...



## Tecnical Results in Piglets

The young piglet starts to consume the dry feed at 3...4 days of live instead of 6...7 days...

Dutch Trial C4 VFA 2 kg/t : + 7% consumption from day 21 to day 28 ...

**FIELD TRIAL:** from day 28 (weaning) to 42 days with 168 piglets in two batches  
(coli,oxy, tyam,fubend,ola)

The increase of weight gain shows the improvement of feed consumption in first weeks.

Group n° 1	Control	C4 VFA
ADG (g)	349	362 (+3,7%)
CR	1.05	1.05

Group n° 2	Control	C4 VFA
ADG (g)	348	388 (+11,5%)
CR	0.98	1.00

**STATION TRIAL 1:** from 28 D (weaning) to 42 days

To check effect on the consumption

control (with acidifier)

C4 VFA (with acidifier)

Day 42	Control	C4 VFA
Consumption (g)	370	397 (+ 7,3%)

**STATION TRIAL 2:** from 25 D (weaning) to 42 days

control (acidifier + antibiotic + enzymes)

C4 VFA

To check effect on Average Daily Gain

Day 42	Control	C4 VFA
ADG (g)	381	393 (+ 3,1%)

## Tecnical Results in Piglets

### Field trial

Day 42 to 67

Control batch: AGP (Antibiotic Growth Promoters)

C4 VFA batch 2 Kg/T (without AGP)

Day 67	Control	C4 VFA
ADG (g)	470	500 (+ 6,4%)

### Field trial

Wageningen Vet University

Day 0 to day 35 postweaning\*\*

CN: Control Negative; CP: Control Positive (+ AGP); C4 VFA (2kg/t)(without AGP)

Day 0 to 14 post weaning	CN	CP	C4 VFA
Consump.	100	106	104
ADG	100	114	114
CR	100	94	90

Day 15 to 35 post weaning	CN	CP	C4 VFA
Consump.	100	101	102
ADG	100	108	112
CR	100	94	92

Day 0 to 35 post weaning	CN	CP	C4 VFA
Consump.	100	102	103
ADG	100	109	113
CR	100	93	91

\*\*The C4 VFA clearly improved the digestive efficiency of piglet, particularly during the two first weeks after weaning

+ 4% ingestion side effect

+ 14% on the growth

and a saving of feed of 10.

The effect endures and increases.

+ 12% quickly of growth and

+ 7% during the weeks 3, 4 and 5 after weaning.

After the weaning:

The relation diarrhoea /villi (Nabuurs): It has been showed that the piglets with diarrhoea have shorter villi and deeper crypts than the piglets without diarrhoea

C. Makking (Wageningen) has observed that piglets which consume feed in maternity, have longer villi and deeper crypts, and then a capacity of absorption over 33% compared to the »no dry feed eater » piglets in maternity.

## Tecnical Results in Piglets

**Field trial:** Farm Gadiot  
C4 VFA at 3kg/T, 4Kg/T & 5kg/T

(Old reference ADG (average daily gain) post weaning...50days: 400/420 g)

date	Piglet number	weight	days	ADG
<u>N°1 3kg/t</u>				
13/07/05	152	7.04		
		16.42	31	300
		32.10	49	510
<u>N°2 3kg/t</u>				
05/08/05	135	6.96		
		16.23	28	330
		29.44	54	420
<u>N°3 3 kg/t</u>				
04/08/05	27	12.55		
		27.00	28	520
		42.00	54	550
<u>N°4 3 kg/t</u>				
25/08/05	160	6.85		
	158	29.95	50	460

<u>N°5 3 kg/t</u>				
14/09/05	162	7.34		
	161	21.07	33	420
		33.17	49	530
<u>N°6 3 kg/t</u>				
06/10/05	161	8.73		
		36.39	50	530
<u>N°7 3 kg/t</u>				
27/10/05	162	7.69		
	161	32.14	48	500
<u>N°8 5kg/t</u>				
08/12/05	160+2	8.10		
		39.10	53	<b>584</b>
<u>N°9 3 kg/t</u>				
29/12/05	161	8.6		
	1	35.95	53	516
<u>N°10 3 kg/t</u>				
06/10/05	161	8.73		
		36.39	50	530

## Tecnical Results in Piglets

**Field trial:** Farm Gadiot  
C4 VFA at 3kg/T, 4Kg/T & 5kg/T

(Old reference ADG (average daily gain) post weaning...50days: 400/420 g)

<u>N°11 4 kg/t</u>					
<u>Case n°</u>	<u>n° animals</u>	<u>weight (19/01/06)</u>	<u>weight (03/02/06)</u>	<u>weight (13/03/06)</u>	<u>ADG</u>
1	25	10.160	15.810	39.350	550
2	26	10.270	15.770	39.420	550
3	26	10.310	16.460	40.460	568
4	26	7.960	12.880	37.390	550
5	26	10.120	15.680	43.240	622
6	25	9.440	14.920	39.320	563
<b>Average</b>		<b>9.71</b>	<b>15.25</b>	<b>39.88</b>	<b>567</b>

## Tecnical Results in Lambs

### Spain

- Usually, the dry feed consumption start at 14 days of live.
- With the C4 VFA supplementation, the dry feed consumption starts at 4 days of live...

### France

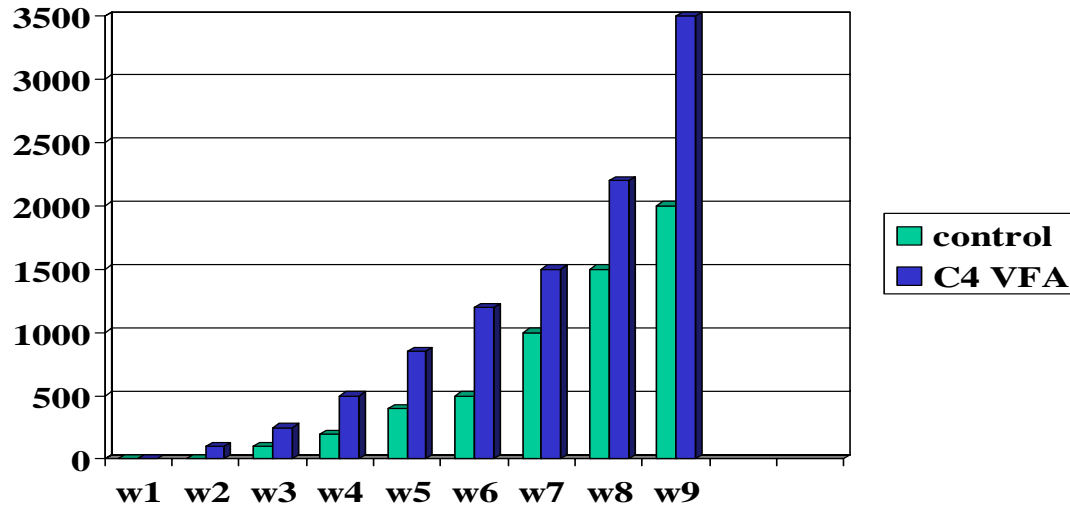
- from 5 to 30 days of live...
- without C4 VFA: consumption/day : 695 g
- with C4 VFA: consumption /day 770 g
- = 10.8% of consumption increase...

Use : 4 kg per tonne

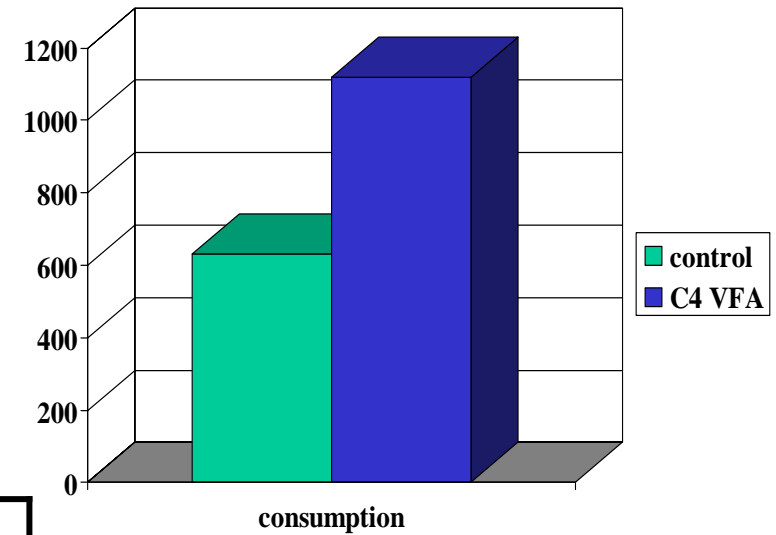
## Tecnical Results in Calves

### Trial 1 Young Calf:

Consumption effect, C4 VFA at 5kg/t



**Trial 2:** Average consumption g/day  
From weaning to 6 months  
C4 VFA at 4 kg/t



**control 630 g**  
**C4 VFA 1120 g = + 43,7 %**

	Consumption (g/day)								
Week	1	2	3	4	5	6	7	8	9
<b>Control</b>	0	0	100	200	400	500	1000	1500	2000
<b>C4 VFA</b>	0	100	250	500	850	1200	1500	2200	3500