



Instituto Nacional de Investigación Agropecuaria  
U R U G U A Y

# Calidad nutricional y potencial nutracéutico de frutos nativos: **Guayabos, Arazá y Guabiyú**

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## Media centre

### Global cancer rates could increase by 50% to 15 million by 2020

World Cancer Report provides clear evidence that action on smoking, diet and infections can prevent one third of cancers, another third can be cured

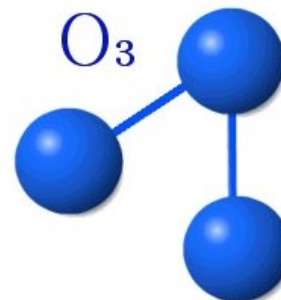
# Salud-enfermedad y ambiente

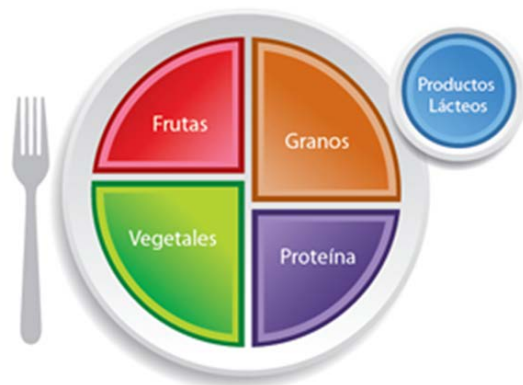
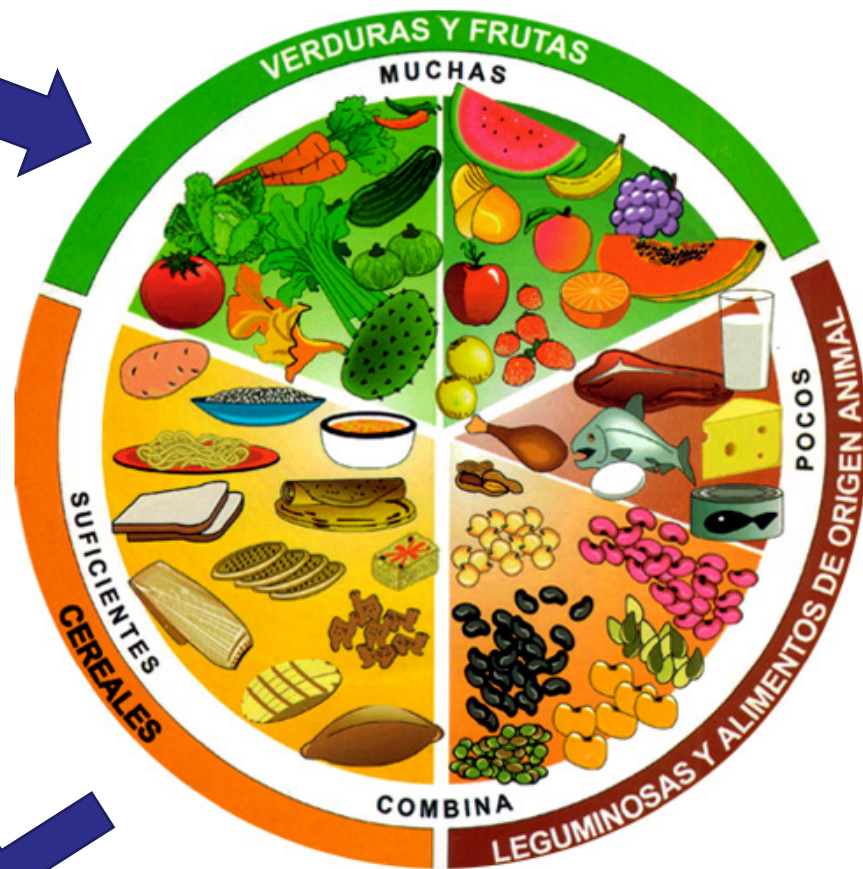
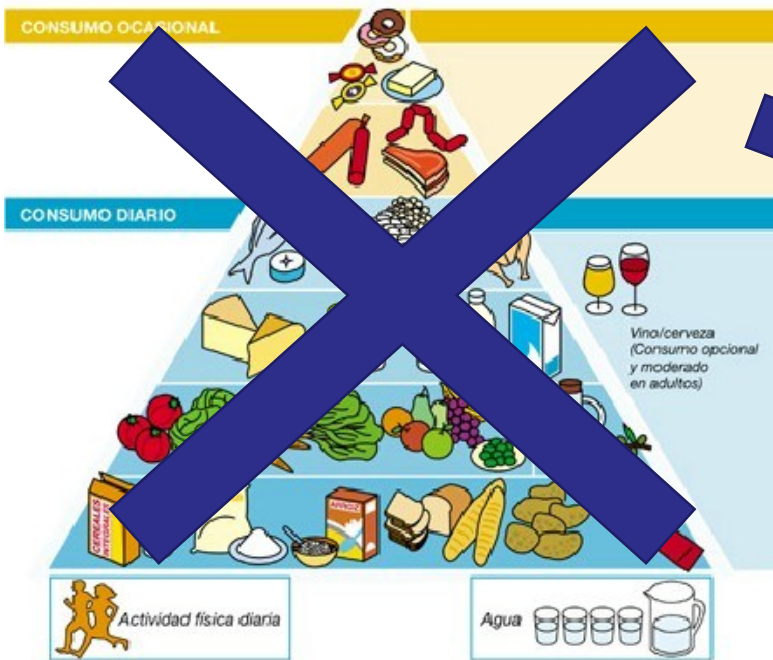
**GENERACIÓN RADICALES LIBRES=**  
PROCESOS NATURALES DEL CUERPO + *FACTORES*  
*EXÓGENOS (AMBIENTE)*



**XENOBIÓTICOS**

"SUSTANCIAS QUÍMICAS  
EXTRAÑAS  
AL SISTEMA BIOLÓGICO"





# Frutas para la salud

## PREVENCIÓN:



ANTIOXIDANTES ENDÓGENOS:  
mecanismo natural del organismo



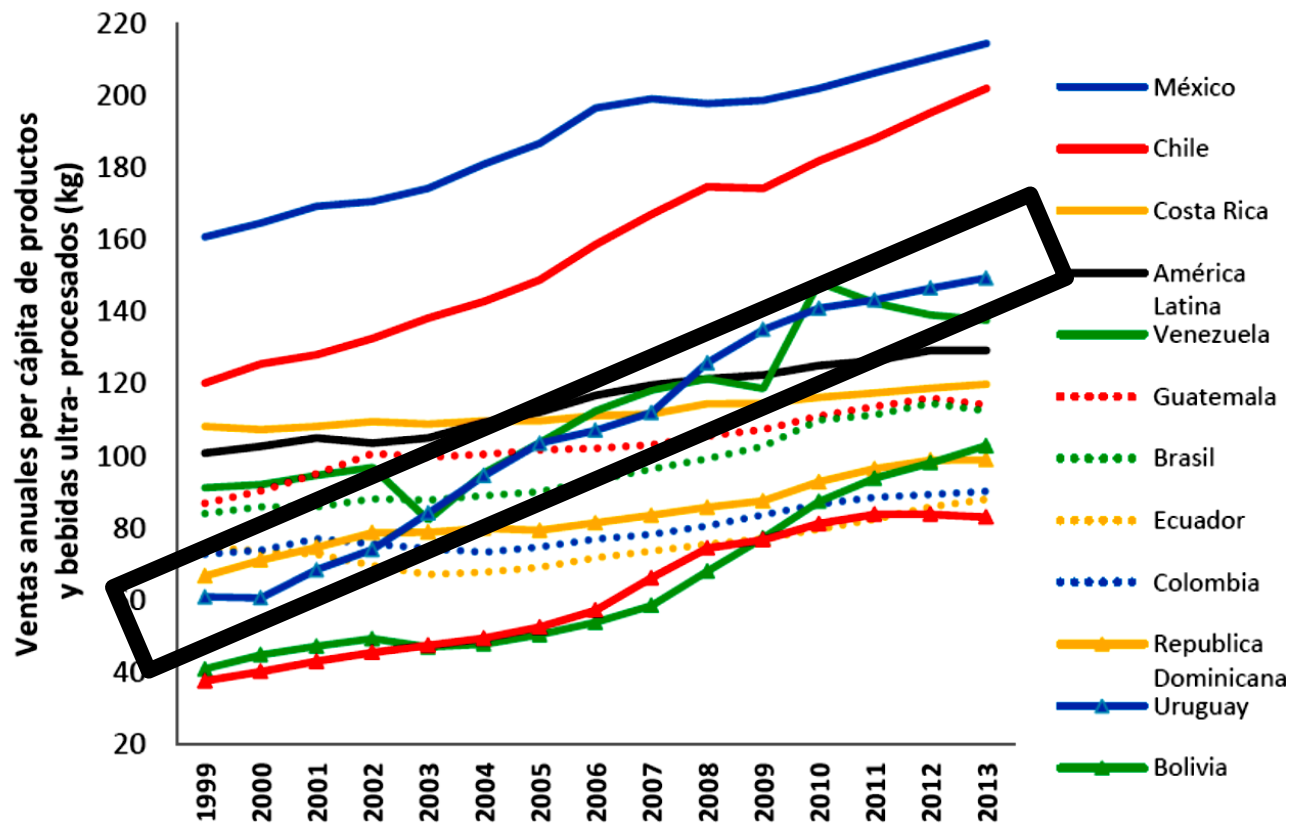
ANTIOXIDANTES EXÓGENOS:  
Aportados por la dieta:  
Vitaminas, minerales y **compuestos fenólicos**



IMPRESINDIBLES PARA  
MECANISMOS FISIOLÓGICOS Y  
COMBATIR EL ESTRÉS  
OXIDATIVO DEL ORGANISMO

# La realidad nuestra

**Figura 1** Tendencias en ventas anuales per cápita de productos alimentarios y bebidas PUP seleccionados<sup>1</sup> (kg) en 12 países latinoamericanos, 1999-2013



<sup>1</sup>Los productos alimentarios y bebidas ultra-procesados aquí incluyen bebidas carbonatadas, jugos de frutas y vegetales, bebidas 'deportivas' y 'energéticas', cereales de desayuno, snacks dulces y salados, golosinas, helados, galletas, cremas para untar y comidas listas. La cantidad en litros se convirtió a kilogramos. Fuente: Euromonitor Passport Global Market Information Database (2014) y WHO Global Burden of Disease.



# Contenido nutricional de los frutos nativos en evaluación

- Las 3 selecciones de guayabo
- Materiales promisorios en evaluación de:
- Guabiyu
- Araza (rojo y amarillos)



# Guayabo

## FAS RN 3 VIII 5



### ORIGEN

Isla Naranjo, Rio Negro



### FRUTO

**Peso y tamaño:** medio  
**Forma:** oval  
**Piel:** verde claro a verde



Árbol



Flor



Fruto

## ILB 154



### ORIGEN

85 S.A.H.1 - Híbrido Tbo 85-04m  
x JP Cerro Chato



### FRUTO

**Peso y tamaño:** medio  
**Forma:** oblanceolado



Árbol



Flor



Fruto

## CLA F3P17



### ORIGEN

R. Marengo Camino Las Piedritas  
Canelones



### FRUTO

**Peso y tamaño:** medio a grande  
**Forma:** circular, globosa  
**Piel:** verde claro a verde medio,



Árbol



Flor



Fruto

# Guayabo

Cultivar	Vitamin C (mg 100 g <sup>-1</sup> )	pH	Titratable Acidity	Soluble solids	P* (%)	K* (%)	Ca* (%)	Mg* (%)	Fe* (mg Kg <sup>-1</sup> )	Zn* (mg Kg <sup>-1</sup> )
154	34.0 a	3.3 b	1.2 b	11.2 b	0.12 a	2.84 b	0.12 a	0.09 b	26.65 a	8.23 a
823	17.3 b	4.0 a	0.5 c	12.1 a	0.10 b	2.17 c	0.10 b	0.05 c	28.38 a	7.25 b
846	22.0 b	3.1 c	1.6 a	11.2 b	0.10 b	3.17 a	0.13 a	0.13 a	23.92 b	6.17 c
CV (%)	11.2	0.74	1.13	3.5	5.4	4.0	4.9	6.4	3.2	2.3

Values followed by the same letter in the column do not differ significantly (Tukey's test, P≤0.05).

\* En base seca

P (mg/100g)	Zn (mg /100g)	K (mg/100g)	Fe (mg/100g)	Ca (mg/100g)	Mg (mg/100g)
17,38	0,12	411,37	0,39	17,38	13,04
19,72	0,14	427,90	0,56	19,72	9,86
16,02	0,10	507,71	0,38	20,82	20,82

## Banana

K: 358 mg/100g

Mg: 27mg/100g

Ca: 5mg/100g

P: 22 mg/100g

Fe: 0,26 mg/100g

Zn: 0.15 mg/100g)

# Arazá



Genot ype	Anthocyanin (mg/100g)	b-carotene (ug/100g)	Vitamin C (mg/100g)	pH	Titratable acidity	Soluble solids	P (%)	K (%)	Ca (%)	Mg (%)	Fe (mg Kg <sup>-1</sup> )	Zn (mg Kg <sup>-1</sup> )
32	0.19 d *	424.5 c	134.7 d	3.6 ab	1.1 d	12.0 ab	0.05 c	2.7 c	0.12 b	0.04 e	23.2 d	4.1 d
56	0.22 d	400.6 c	164.0 d	3.5 bc	1.3 c	10.4 b	0.07 b	2.9 bc	0.17 c	0.06 c	26.0 c	5.2 c
57	0.15 d	550.1 bc	210.7 c	3.7 a	1.0 d	12.8 a	0.08 ab	2.8 bc	0.17 c	0.05 d	26.1 c	6.5 ab
317	4.23 c	790.8 a	330.3 b	3.2 d	1.7 a	11.9 ab	0.09 a	3.5 a	0.30 a	0.09 a	28.8 b	6.9 a
334	6.59 a	615.2 b	303.7 b	3.4 c	1.5 b	11.9 ab	0.07 b	3.2 ab	0.29 a	0.09 a	35.9 a	6.7 ab
335	5.89 b	637.3 ab	427.0 a	3.5 bc	1.4 b	12.0 ab	0.08 ab	3.3 a	0.25 b	0.07 b	24.6 cd	6.1 b
CV (%)	6.6	10.7	4,5	0.9	2.1	5.4	5.6	4.7	1.9	3.6	3,0	4.2

P (mg/100g)	K (mg/100g)	Ca (mg/100g)	Mg (mg/100g)	Fe (mg/100g)	Zn (mg/100g)
7,50	405,00	18,00	6,00	0,35	0,06
10,50	435,00	25,50	9,00	0,39	0,08
12,00	420,00	25,50	7,50	0,39	0,10
13,50	525,00	45,00	13,50	0,43	0,10
10,50	480,00	43,50	13,50	0,54	0,10
12,00	495,00	37,50	10,50	0,37	0,09

## Arandano

K: 77 mg/100g  
Mg: 6mg/100g  
Ca: 6mg/100g  
P: 12 mg/100g  
Fe: 0,3mg/100g  
Zn: 0.15 mg/100g)

## Frutilla

Vitamina C: 58mg/100g  
Betacaroteno: 1ug/100g)  
K: 153 mg/100g  
Ca: 16mg/100g  
Mg: 13mg/100g  
P: 24 mg/100g  
Fe: 0,4mg/100g  
Zn: 0.1 mg/100g)

# Guabiyú

Genotype	Peel				Pulp			
	Vitamin C		Anthocyanins		Vitamin C		Anthocyanins	
	Green	Mature	Green	Mature	Green	Mature	Green	Mature
2	93.9 c*	35.1 f	54.1 b	163.1 cd	11.4 d	15.5 b	1.8 ab	0.0 d
5	139.2 a	133.1 a	62.3 b	286.7 a	20.7 b	22.5 a	0.08 c	0.4 c
6	132.7 a	138.3 a	61.5 b	180.0 c	23.3 a	23.5 a	0.1 c	0.2 d
7	80.2 d	80.4 d	86.5 a	230.4 b	7.1 e	12.4 c	0.08 c	0.1 d
8	112.6 b	52.7 e	60.8 b	132.6 d	11.7 d	7.6 d	1.7 b	1.7 a
11	111.3 b	100.3 c	42.2 c	128.9 d	12.0 d	12.3 c	0.05 c	0.0 d
12	104.1 bc	107.9 b	77.0 a	149.8 cd	15.5 c	14.5 b	2.0 a	0.7 b
CV (%)	3.85	2.86	5.85	7.18	3.86	4.48	12.62	17.07

Content of vitamin C (mg 100 g<sup>-1</sup>) and anthocyanins (mg 100 g<sup>-1</sup>) in peel and pulp of guabiyu fruits harvested green and mature.

\* Values followed by the same letter in the column do not differ significantly (Tukey's test, P≤0.05).



## **Arandanos**

Vitamina C: 9,7 mg /100g

Antocianinas: 100 – 260 mg/100G

# Semillas y su potencial como alimento

Genotype	Protein (%)	Ash (%)	Starch (%)	Lipid (%)	Tannin (%)	P (%)	K (%)	Ca (%)	Mg (%)	Fe (mg Kg <sup>-1</sup> )	Zn (mg Kg <sup>-1</sup> )
32	10.6 b*	4.9 b	1.3 ab	18.0 a	ND	0.05 c	0.88 ab	0.21 d	0.08 b	58.2 c	17.3 b
56	14.1 a	5.2 b	1.2 ab	19.4 a	ND	0.04 d	0.72 bc	0.22 d	0.10 a	68.3 b	16.9 b
57	7.9 bc	3.9 b	1.4 a	17.8 a	ND	0.06 b	1.01 a	0.23 d	0.07 c	70.1 b	21.3 a
317	5.4 cd	8.7 a	0.4 c	12.2 a	ND	0.07 a	0.49 d	0.29 c	0.04 d	32.4 e	8.1 d
334	5.4 cd	4.8 b	0.7 bc	10.8 a	ND	0.04 d	0.91 ab	0.52 a	0.07 c	73.1 a	11.6 c
335	3.7 d	6.1 b	0.1 c	11.2 a	ND	0.04 cd	0.51 cd	0.37 b	0.04 d	43.9 d	12.6 c
CV (%)	10.6	14.7	19.0	20.9		6.5	9.9	5.5	3.7	1.9	6.3

Centesimal composition (on dry basis), moisture and minerals in fruit seeds of different genotypes of Strawberry guava.

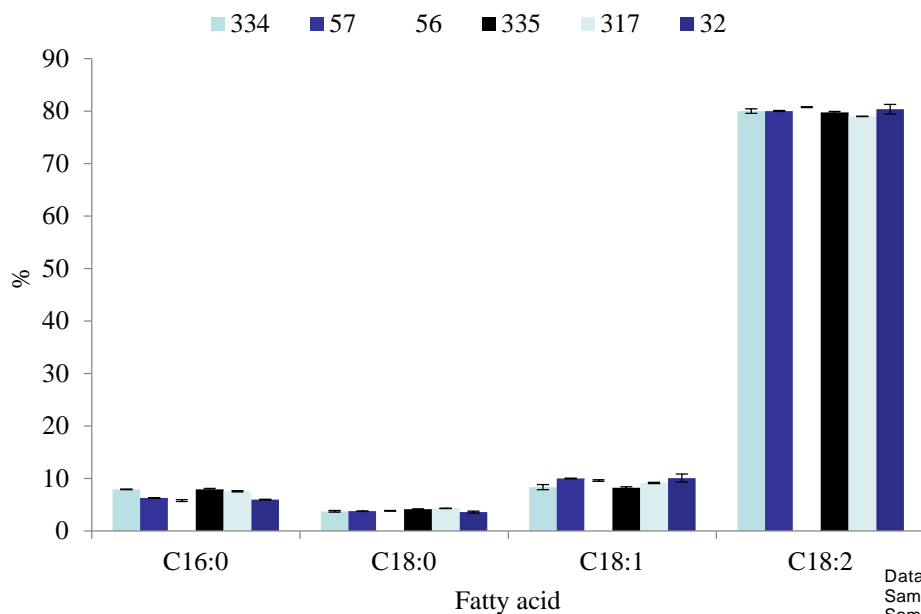
\* Values followed by the same letter in the column do not differ significantly (Tukey's test, P≤0.05).

Genotype	Protein (%)	Ash (%)	Starch (%)	Lipids (%)	Tannin (%)	P (%)	K (%)	Ca (%)	Mg (%)	Fe (mg Kg <sup>-1</sup> )	Zn (mg Kg <sup>-1</sup> )
2	1.25 c *	3.63 a	34.2 a	2,50 c	6,25 cd	0.09 a	1.41 c	0.37 a	0.08 b	76.9 a	10.0 ab
5	2.25 abc	2.68 abc	36.4 a	3,17 bc	9,27 b	0.08 ab	1.12 d	0.21 e	0.05 d	29.2 c	10.2 a
6	3.16 a	2.38 bc	41.8 a	3,46 b	11,08 a	0.09 a	1.76 b	0.19 e	0.07 c	28.2 c	8.4 abc
7	1.91 bc	2.09 c	35.6 a	3,69 b	7,60 c	0.07 b	1.94 a	0.23 d	0.09 a	31.1 b	7.7 bcd
8	2.38 abc	2.06 c	43.3 a	5,10 a	6,16 d	0.09 a	1.62 b	0.34 b	0.09 a	28.9 c	9.9 ab
11	2.46 ab	3.26 ab	31.9 a	3,63 b	6,86 cd	0.07 b	1.69 b	0.31 c	0.09 a	25.2 d	6.0 d
12	1.92 bc	2.92 abc	32.9 a	3,37 bc	11,60 a	0.07 b	1.60 b	0.31 c	0.08 b	24.6 d	7.0 cd
CV (%)	16.6	12.6	13.4	6,62	5,98	5.5	3.7	2.2	2.8	1.7	10.2

Centesimal and mineral (on dry basis) content of seeds of different genotypes of Guabijú.

\* Values followed by the same letter in the column do not differ significantly (Tukey's test, P≤0.05).

# Semillas y su potencial como alimento

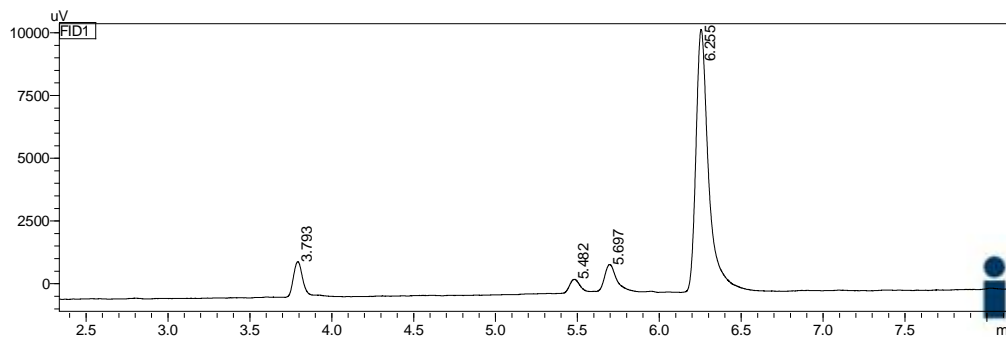


1. ACEITE DE GIRASOL COMPOSICION DE ACIDOS GRASOS

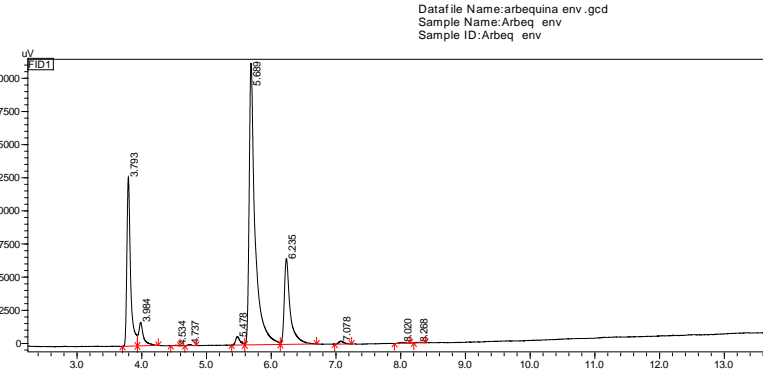
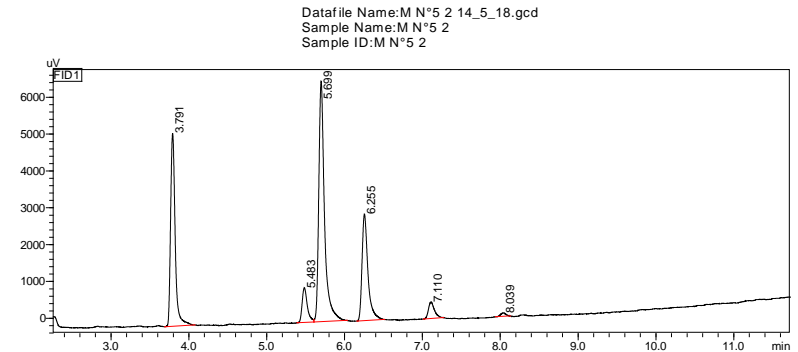
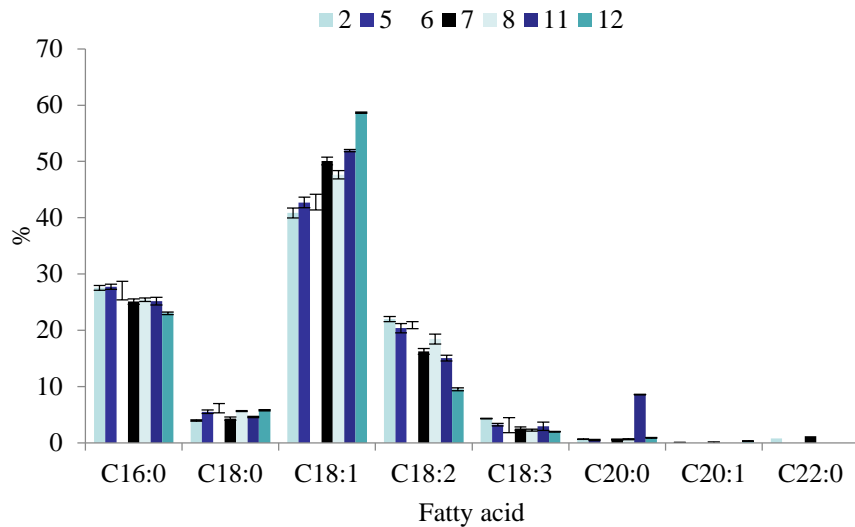
ACIDO GRASO	ABREVIATURA	CONTENIDO
AC PALMITICO	16:0	8 a 14 %
AC ESTEARICO	18:0	
AC OLEICO	18:1	14 a 53 %
AC LINOLEICO	18:2	38 a 73 %
AC LINOLENICO	18:3	trazas

Datafile Name:334\_1 15\_05\_18.gcd  
 Sample Name:334\_1  
 Sample ID:334\_1

FAMEs Arazá



# Semillas y su potencial como alimento



FAMES Guabiyú vs Aceite oliva Arbequina



9º ENCUENTRO NACIONAL  
SOBRE FRUTOS NATIVOS

1ª Fiesta Nacional  
del Guayabo del País



Muchas gracias