

## CHIA OIL (SALVIA HISPANICA L.) TECHNICAL SHEET

### PRODUCT

Chia Oil (Salvia Hispánica L.)

### 1. GENERAL INFORMATION

Cold – Pressed oil extract of chia seed (Salvia Hispanica L.)

### 2. COMPOSITION

DESCRIPTION	%
Chia Oil	99.98
Antioxidant (Tocopheroles)	200 ppm
<b>TOTAL</b>	<b>100</b>

### 3. CHARACTERISTICS

Analysis	/ Informe Fundación Chile	
	Recover Drum	Stainless Steel Drum
Color	30a / 5.3r / 0.0az	30a / 5.3r / 0.0az
Waxes (ppm)	950	950
Impurities (%)	<0.03	<0.03
Iodine index	172 ± 11	166 ± 9
Saponification index	156 ± 2.11	160,1 ± 1,77
Refraction index	1,4826	1,4830

B. OXIDATIVE STATE IN TIME	
Oil	Rancimat
Chia Recover drum	14,80 ± 1,11
Chia Stainless Steel Drum	15,00 ± 1,00
Flax seed	9,88 ± 0,70
Canola seed	30,10 ± 1,33

C.1 OXIDATIVE STABILITY IN BULK Time (days)	Stainless Steel Drum	
	Peroxides	Acidity
0	1,27	0,23
14	1,90	0,40
30	1,47	0,32
60	3,77	0,26
90	4,10	0,35
120	5,98	0,25
150	5,75	0,25
180	5,64	0,32
360	6,20	0,20

C.2 OXIDATIVE STABILITY IN BOTTLE				
Time (days)	Full bottles		Open top bottles	
	Peroxides	Acidity	Peroxides	Acidity
0	1,33	0,17	1,30	0,19
14	1,30	0,33	1,70	0,28
30	1,22	0,27	1,45	0,32
60	2,29	0,30	3,00	0,13
90	3,11	0,35	5,66	0,13
120	4,55	0,29	8,00	0,37
150	7,55	0,25	12,15	0,26
180	4,19	0,19	9,91	0,48
360	8,00	0,25	12,2	0,28

D. COOK CYCLES STABILITY		
Cook cycles	Peroxides	Acidity
0	1,33	0,18
1	2,90	0,56
2	2,10	0,40
3	3,30	0,45

E. NUTRITIONAL CHARACTERISTICS			
Saturated Fatty acids	% Metil Ester	g/100g	mg/100g
C12:0 Docecanoic	0,000	0,000	0,000
C14:0 Tetradecanoic	0,021	0,021	21,081
C16:0 Palmitic	7,115	7,043	7.042,57
C18:0 Estearic	3,141	3,110	3.109,61
C20:0 Eicosanoic	0,272	0,269	269,15
C22:0 Docosanoic	0,043	0,042	42,04
C24:0 Tetracosanoic	0,089	0,088	88,49
<b>Total</b>	<b>10,681</b>	<b>10,573</b>	<b>10.572,93</b>

Monounsaturated Fatty acids	% Metil Ester	g/100g	mg/100g
C14:1 Tetradecenoic	0,000	0,000	0,000
C16:1 Palmitoleic	0,036	0,035	35,230
C18:1 Oleic	7,195	7,122	7.122,35
C20:1n9 Eicosaenoic	0,137	0,135	135,23
C22:1n9 Erucic	0,000	0,000	0,000
C24:1n9 Tetracosanoic	0,006	0,006	6,235
<b>Total</b>	<b>7,374</b>	<b>7,299</b>	<b>7.299,04</b>

Polyunsaturated Fatty Acids	% Metil Ester	g/100g	mg/100g
C18:2n6 Linoleic	19,232	19,036	19.036,17
C18:3n3 Linolenic	62,640	62,004	62.003,82
C20:2n6 Eicosadienoic	0,027	0,027	26,813
C20:3n6 Eicosatrienoic	0,000	0,000	0,000
C20:3n3 Eicosatetrienoic	0,024	0,023	23,383
C20:4n6 Eicosatetraenoic	0,015	0,015	15,277
C20:5n3 Eicosapentanoic	0,000	0,000	0,000
C22:5n3 Docosapentaenoic	0,007	0,007	6,655
C22:6n3 Docosahexaenoic	0,000	0,000	0,000
<b>Total</b>	<b>81,945</b>	<b>81,112</b>	<b>81.112,12</b>

The statistical projection done on the results of the oxidative analysis, indicates a shelf life estimated up to 24 months, when optimal storage conditions have been respected.

These optimal conditions require a temperature inferior to 20°C, avoiding the direct light (dark turnpike) and the gradual use of each drum.

## 5. FLOW CHART

Industrial process. [Exhibit](#)

## 6. OTHERS

### a. GMO

The crops of chia Benexia are totally free of Genetically Modified Organisms, given that the seed have been obtained through a natural selection process over the years which is permanently going on. [Certificate N° C653106 Cámara Arbitral de Cereales](#)

### b. Certificate CTFA (Cosmetic, Toiletry and Fragrance Association)

The chia oil has been authorized by CTFA to be used in the manufacturing, of cosmetic products, such as moisturizers and antioxidants.

Chia Oil

[INCI 9219 \(Salvia Hispánica seed oil\)](#)

EXHIBITS

EXHIBIT 1.



**TRIO S.A.**

**CERTIFICADO DE ANALISIS**  
Nº I - 6057

**CONFIDENTIAL**

**ANÁLISIS TÉCNICO ACEITE DE CHIA**

1.- Características Físicas:

<b>Análisis</b>	<b>Aceite Filtrado</b>
Color	30a / 5.3r / 0.0az
Ceras (ppm)	950
Impurezas (%)	<0.03

EXHIBIT 2.

**INFORME DE RESULTADOS PARCIALES**

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**Estudio Aceite a Granel**

**1. Análisis de caracterización del aceite**

Análisis	Tambor recubierto	Tambor Acero Inoxidable
Índice de Yodo	172 ± 11	166 ± 9
Índice de Saponificación	156,3 ± 2,11	160,1 ± 1,77
Índice de Refracción	1,4826	1,4830

**2. Comparación de la rapidez de oxidación con otros aceites**

Aceite	Rancimat (hrs)
Chia Tambor plástico recubierto	14,80 ± 1,11
Chia Tambor Acero inoxidable	15,00 ± 1,00
Linaza	9,88 ± 0,70
Canola	30,10 ± 1,33

**3. Estudio de estabilidad**

Tiempo (días)	Tambor Acero Inoxidable	
	I. de peroxidos	Acidez
0	1,27	0,23
14	1,90	0,40
30	1,47	0,32
60	3,77	0,26
90	4,10	0,35
120	5,98	0,25
150	5,75	0,25
180	5,64	0,32
360	6,20	0,20

Laboratorio de Agroindustria

## Estudio Aceite a nivel de consumidor

### 1. Estudio de estabilidad

Tiempo (días)	Botellas siempre llenas		Botellas abiertas	
	I. de peroxidos	Acidez	I. de peroxidos	Acidez
0	1,33	0,17	1,30	0,19
14	1,30	0,33	1,70	0,28
30	1,22	0,27	1,45	0,32
60	2,29	0,30	3,00	0,13
90	3,11	0,35	5,66	0,13
120	4,55	0,29	8,00	0,37
150	7,55	0,25	12,15	0,26
180	4,19	0,19	9,91	0,48
360	8,00	0,25	12,20	0,28

### 2. Estudio de ciclos de fritura

Ciclos de fritura	I. de peroxidos	Acidez
0	1,33	0,18
1	2,90	0,56
2	2,10	0,40
3	3,30	0,45


### 3. Perfil de ácidos grasos

Ácidos Grasos saturados	% Metil Ester	g/100g	mg/100g
C12:0 Ácido Docecanoico	0,000	0,000	0,000
C14:0 Ácido Tetradecanoico	0,021	0,021	21,081
C16:0 Ácido Palmítico	7,115	7,043	7.042,57
C18:0 Ácido Estearico	3,141	3,110	3.109,61
C20:0 Ácido Eicosanoico	0,272	0,269	269,15
C22:0 Ácido Docosanoico	0,043	0,042	42,04
C24:0 Ácido Tetracosanoico	0,089	0,088	88,49
<b>Total Ac. Grasos Saturados</b>	<b>10,681</b>	<b>10,573</b>	<b>10.572,93</b>




Ácidos Grasos Monoinsaturados	% Metil Ester	g/100g	mg/100g
C14:1 Ácido Tetradecenoico	0,000	0,000	0,000
C16:1 Ácido Palmitoleico	0,036	0,035	35,230
C18:1 Ácido Oleico	7,195	7,122	7.122,35
C20:1n9 Ácido Eicosaenoico	0,137	0,135	135,23
C22:1n9 Ácido Erucico	0,000	0,000	0,000
C24:1n9 Ácido Tetracosanoico	0,006	0,006	6,235
<b>Total Ac. Grasos Monoinsaturados</b>	<b>7,374</b>	<b>7,299</b>	<b>7.299,04</b>

Ácidos Grasos Poliinsaturados	% Metil Ester	g/100g	mg/100g
C18:2n6 Ácido Linoleico	19,232	19,036	19.036,17
C18:3n3 Ácido Linolenico	62,640	62,004	62.003,82
C20:2n6 Ácido Eicosadienoico	0,027	0,027	26,813
C20:3n6 Ácido Eicosatrienoico	0,000	0,000	0,000
C20:3n3 Ácido Eicosatetrienoico	0,024	0,023	23,383
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C20:5n3 Ácido Eicosapentanoico	0,000	0,000	0,000
C22:5n3 Ácido Docosapentanoico	0,007	0,007	6,655
C22:6n3 Ácido Docosahexanoico	0,000	0,000	0,000
<b>Total Ac. Grasos Poliinsaturados</b>	<b>81,945</b>	<b>81,112</b>	<b>81.112,12</b>

EXHIBIT 3.



**CÁMARA ARBITRAL DE CEREALES**  
 Córdoba 1402 - 52000ARV Rosario - Santa Fe - Rep. Argentina  
 Tel: 54-041-4213471 al 78 - FAX: Interno 2211  
 e-mail: camara@bcr.com.ar  
 web site: www.bcr.com.ar

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**CERTIFICADO DE ANÁLISIS**

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<p>ISSUE DATE: <b>October 21, 2005.</b></p> <p>FUNCTIONAL PRODUCTS S.A.</p>	<p>Nº: <b>C653106</b></p> <p>Page: <b>1/1</b></p>
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**Declared Sample: COLUMBUS SEED SDS - C**

Identificación: ND	Entry Date: 10/18/2005	Date of sample taking: ND
	Open Sample: YES	

Date of completion of tests : 10/18/05 - 10/21/05

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La Cámara Arbitral de Cereales de la Bolsa de Comercio de Rosario  
 certifica los siguientes resultados:


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<u>TES</u>	<u>RE ULTS</u>	<u>UN/ TY</u>	<u>ANAL SIST/ CHN/QU</u>
Genetically Modified Organism	Negative	--	PCR (Polymerase Chain Reaction) achieved sensitivity of the assay 0,1%

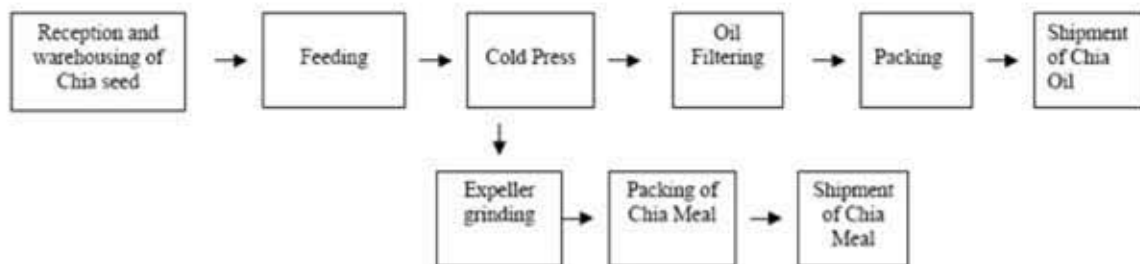
Weight of analyzed sample: 210 g.

OAA Accredited Laboratory N° LE-021. The test being described here is within the laboratory range of accreditation

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<p>Due: \$300,00</p> <p>Invoiced to: <b>FUNCTIONAL PRODUCTS S.A.</b></p> <p style="font-size: x-small;">(N): Not Declared              The results displayed here correspond only to the treated sample              This certificate can only be reproduced by written authorization of Cámara Arbitral de Cereales (Grain Arbitration Board)</p>	 <b>Roberto Figueredo</b> Director de Laboratorio
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CHIA OIL INDUSTRIAL PROCESS



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