

# Tritordeum

## Quality Management



# Index



<b>Introduction</b>	page 3
<b>About</b>	page 4
<b>Portfolio</b>	page 5
<b>Seed</b>	page 6
<b>Grain</b>	page 7
<b>Organic Grain</b>	page 9
<b>Malt</b>	page 10
<b>Organic Malt</b>	page 12
<b>Flour</b>	page 13
<b>Organic Flour</b>	page 15
<b>Quality Control</b>	page 17
<b>Traceability</b>	page 18
<b>Complaints</b>	page 19
<b>IP, GMO, Declaration, Allergens</b>	page 20



# Introduction

Welcome to the **Quality Manual of Tritordeum**, your comprehensive guide to the portfolio of grains and ingredients commercialized by **Vivagran** and its licensees. In this manual, we provide detailed product specifications for each material type, outlining minimum requirements for commercialization. Additionally, we offer insights into our **Quality Control** procedures, **Traceability** measures, **Complaints** handling, and **Intellectual Property** management.

Each material type in our portfolio is accompanied by a **product specification** that delineates the minimum requirements necessary for commercialization. These specifications serve as a benchmark for ensuring consistent quality and performance across our product range.

At Vivagran, we are committed to upholding the highest standards of quality. Our **quality control procedure encompasses rigorous testing and analysis** at every stage of production, from sourcing raw materials to final product inspection. By adhering to strict quality control protocols, we guarantee the integrity and safety of our products.

Traceability is paramount in our operations, as it allows us to **track the journey of our products from farm to fork**. Through meticulous record-keeping and advanced tracking systems, we ensure full traceability and transparency, providing customers with confidence in the origin and quality of our Tritordeum products.

We take customer feedback seriously and have established a **robust complaints handling process** to address any issues or concerns promptly. Our team is committed to resolving complaints efficiently and implementing corrective actions to prevent recurrence, thereby continuously improving our products and services.

Protecting our intellectual property is vital to **safeguarding the integrity and reputation of Tritordeum**. We employ robust intellectual property management strategies to safeguard our innovations and prevent unauthorized use or infringement.

For inquiries regarding the quality of Tritordeum products, please contact: [evassiliadis@vivagran.nl](mailto:evassiliadis@vivagran.nl)

Thank you for entrusting Tritordeum for your grain and ingredient needs. We are dedicated to delivering excellence in quality and service, and we look forward to serving you.

Discover more about Tritordeum at: [www.tritordeum.com](http://www.tritordeum.com)



# About

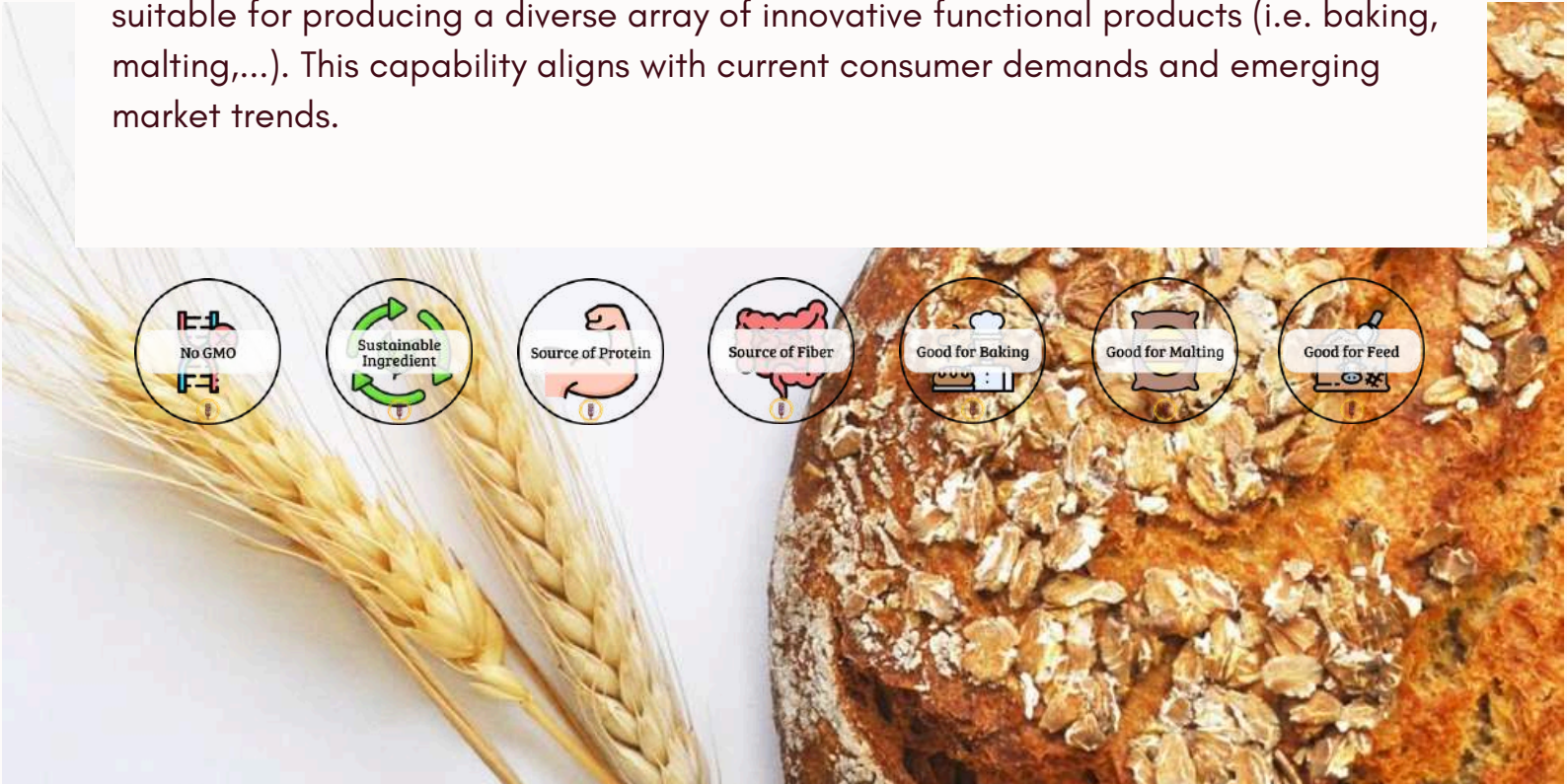
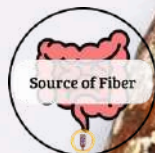
Tritordeum is a **novel natural cereal crop**, resulting from a cross between durum wheat (*Triticum durum*) and wild barley (*Hordeum chilense*). It distinguishes itself through its **nutritional, agronomic, and sensory qualities**.

This new Spanish crop has been developed using traditional breeding techniques; it is not a genetically modified organism (GMO). It marks the first instance of a newly created cereal suitable for human consumption. As a natural crop species, it is registered with the Community Plant Variety Office (CPVO) of the European Union.

From an agronomic perspective, **Tritordeum is a resilient crop**, with yields comparable to wheat and displaying strong resistance to pathogens. Its minimal water and fertilizer requirements contribute to its reputation as a more **sustainable cereal**. Currently, it is cultivated in the Mediterranean region and Australia in both conventional and organic farming methods.


From a nutritional standpoint, Tritordeum excels due to its **lower content of indigestible gluten proteins** compared to wheat, rendering it a more easily digestible cereal. Additionally, Tritordeum is notable for its **high content of protein, dietary fiber** - arabinoxylans and fructans, active prebiotic carbohydrates that support the maintenance of intestinal bacterial flora, **lutein** - an antioxidant associated with eye health.

Tritordeum possesses **unique qualities and functionalities**, making it highly suitable for producing a diverse array of innovative functional products (i.e. baking, malting,...). This capability aligns with current consumer demands and emerging market trends.



# Portfolio

Seed, Grains, Malts, Flours







	CATEGORY	ARTICLES	ORIGINS	FORMATS
	Seeds	SC-TR SC-ST		600kg BB
	Grains	GC-E	    	1000kg BB
		 GE-E	 	Bulk
	Malts	 GE-M		25kg bag
		 GC-M-CADIZ	 	25kg bag
		 GC-M-CERES		1000kg BB
		GC-M-ATLAS		Bulk
	Refined Flours	HCCR-E	 	25kg
		 HPCR-E		25kg
	Wholegrain Flours	HCCI-E	 	25kg
		 HPCI-E		25kg
	Malt Flours	 HCCI-M-CADIZ		25kg
		 HCCI-M-CERES		25kg

**NEW**

# Seed

Aucan, Bulel, Coique



	AUCAN	BULEL	COIQUE	HT-s*
<b>Applications</b>		 		 
<b>Specific Weight</b>	72-80	72 - 80	74 - 82	74 - 82
<b>Protein (%)</b>	13 - 17	13 - 17	15 - 18	15 - 18
<b>Yields</b>				
<b>Rainfed</b>	3 - 5	3 - 5	4 - 6	5 - 7
<b>Irrigated</b>	6 - 8	5 - 8	7 - 9	7 - 9

\*Tritordeum varieties under screening in multiple geographies.



# Grain

## Milling and Malting Specifications



min

max

target

min

max

target

**Specific Weight  
(Kg/hL)**

68

72

68

72

**Broken grains (%)**

5

3

5

3

**Pregerminated (%)**

2

0

2

0

**Moisture (%)**

15

12

15

12

**Protein (%)**

12,5

15

14

16

**Hagbert (sec)**

220

350

220

350

**Germination (%)**

95

100

**Fraction <2mm (%)**

8

5

**Fraction >2,2mm (%)**

95

100



# Grain

## Specifications



### Nutritional Composition

typical value

<b>Energy (KJ-Kcal)</b>	1500 - 350
<b>Carbohydrates (%)</b>	67
<b>Sugars (%)</b>	2
<b>Moisture (%)</b>	12,5
<b>Protein (%)</b>	15
<b>Dietary Fiber (%)</b>	15
<b>Fats (%)</b>	1,8
<b>Saturated fats (%)</b>	0,4
<b>Salt (%)</b>	0,03
<b>Sodium (%)</b>	< 0,1

### Microbiology

	max ufc/g	method
<b>Aerobic mesofiles</b>	1.10 <sup>6</sup>	NF EN ISO 4833-1
<b>B. cereus</b>	100	BKR 23/06-02/10
<b>E. coli</b>	10	BRD 07/08-12/04
<b>C. perfringis</b>	10	NF EN ISO 7937
<b>Enterobacterias</b>	1.10 <sup>4</sup>	NF EN ISO 4833-1
<b>Moulds</b>	1.10 <sup>4</sup>	NF V08/059
<b>Salmonella</b>	0	BRD 07/11-12/05
<b>Staphylococcus</b>	10	NF EN ISO 6888-2

### Toxicology

	max
<b>Cadmium</b>	0,2 ppm
<b>Lead</b>	0,2 ppm
<b>Arsenic</b>	0,03 ppm
<b>Mercury</b>	0,005 ppm
<b>Total Aflatoxines</b>	4 ppb
<b>Aflatoxine B1</b>	2 ppb
<b>Ochratoxine A</b>	1 ppb
<b>Deoxinivavenol (DON)</b>	750 ppb
<b>Zearalenone</b>	75 ppb



# Organic Grain

## Specifications



CCPAE: CT-004020 CE



### Nutritional Composition

typical value

<b>Energy (KJ-Kcal)</b>	1500 - 350
<b>Carbohydrates (%)</b>	67
<b>Sugars (%)</b>	2
<b>Moisture (%)</b>	12,5
<b>Protein (%)</b>	15
<b>Dietary Fiber (%)</b>	15
<b>Fats (%)</b>	1,8
<b>Saturated fats (%)</b>	0,4
<b>Salt (%)</b>	0,03
<b>Sodium (%)</b>	< 0,1

### Microbiology

	max ufc/g	method
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<b>Moulds</b>	1.10 <sup>4</sup>	NF V08/059
<b>Salmonella</b>	0	BRD 07/11-12/05
<b>Staphylococcus</b>	10	NF EN ISO 6888-2

### Toxicology




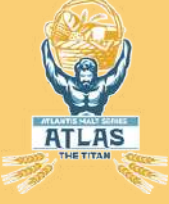
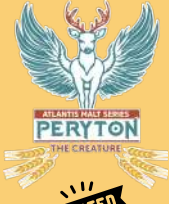




	max
<b>Cadmium</b>	0,2 ppm
<b>Lead</b>	0,2 ppm
<b>Arsenic</b>	0,03 ppm
<b>Mercury</b>	0,005 ppm
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<b>Aflatoxine B1</b>	2 ppb
<b>Ochratoxine A</b>	1 ppb
<b>Deoxinivavenol (DON)</b>	750 ppb
<b>Zearalenone</b>	75 ppb

Our organic Tritordeum grain is packaged immediately upon harvest in a **bigbag with a CO2 controlled atmosphere**. This advanced technology ensures the product remains insect-free for an extended duration, preserving its quality and freshness over time.



# Malt

## Brewing and Food Specifications

		 ATLANTIS MALT SERIES <b>CADIZ</b> THE SWEET	 ATLANTIS MALT SERIES <b>CERES</b> THE FIERY	 ATLANTIS MALT SERIES <b>ATLAS</b> THE TITAN	 ATLANTIS MALT SERIES <b>PERYTON</b> THE CREATURE <b>LIMITED STOCK</b>
<b>Applications</b>					
<b>Color (EBC)</b>	4,5 - 9,5	80 - 100	15 - 25	15 - 25	
<b>Extract (%)</b>	min 80	min 77	min 80	min 80	
<b>Diastatic Power (Wk)</b>	350 - 550	NA	500 - 650	250 - 400	

**BOORTMALT**  
MASTERS OF MALT



# Malt

## Specifications - typical values



<b>Extract (%)</b>	80	75	83
<b>Wort color (EBC)</b>	9,5	90	13,7
<b>Color KZ (EBC)</b>	13,5	-	18,4
<b>Moisture (%)</b>	6,1	5,0	6,2
<b>Total Protein (%)</b>	16,5	13,0	16,7
<b>Soluble Protein (%)</b>	6,4	-	8
<b>Kolbach Index (%)</b>	38,8	-	48
<b>Viscosity (cP)</b>	1,67	-	1,50
<b>pH</b>	5,67	-	5,69
<b>Diastatic power (Wk)</b>	380	-	529
<b>FAN (ppm)</b>	173	-	267
<b>BetaGlucan (ppm)</b>	78	-	70

# Organic Malt

## Specifications



CCPAE: CT-004020 CE



typical value

<b>Extract (%)</b>	80
<b>Wort color (EBC)</b>	9,5
<b>Color KZ (EBC)</b>	13,5
<b>Moisture (%)</b>	6
<b>Total Protein (%)</b>	13
<b>Soluble Protein (%)</b>	6
<b>Kolbach Index (%)</b>	40,5
<b>Viscosity (cP)</b>	1,67
<b>pH</b>	5,67
<b>Diastatic power (Wk)</b>	380
<b>FAN (ppm)</b>	170
<b>BetaGlucan (ppm)</b>	75

Our organic Tritordeum malt is used in baking as an inclusion in the bread crumb.

This ingredient is produced exclusively for Vivagran by:



# Flours

## Specifications



### Refined

### Wholegrain

	min	max	target	min	max	target
--	-----	-----	--------	-----	-----	--------

<b>Extraction (%)</b>	68	72	70	85	95	90
<b>W</b>	70		140	40		80
<b>P/L</b>	0,3		0,6	0,2		0,4
<b>Wet Gluten (%)</b>	27		30	22		25
<b>Dry Gluten (%)</b>	8,5		10	6,5		8
<b>Gluten Index</b>	85		90	60		65
<b>Texture</b>	Soft, lumpy			Soft, with bran particles		
<b>Color</b>	Golden yellow			Ocre, amber		
<b>Taste</b>	not rancid, acid or bitter			not rancid, acid or bitter		



# Flours

## Nutritional Compositions



### Nutritional Composition

	Refined	Wholegrain
<b>Energy (KJ-Kcal)</b>	1500 - 350	1500 - 350
<b>Carbohydrates (%)</b>	74	67
<b>Sugars (%)</b>	2	2
<b>Moisture (%)</b>	12,5	12,5
<b>Protein (%)</b>	12,5	15
<b>Dietary Fiber (%)</b>	6,5	15
<b>Fats (%)</b>	1,8	1,8
<b>Saturated fats (%)</b>	0,4	0,4
<b>Salt (%)</b>	0,03	0,03
<b>Sodium (%)</b>	< 0,1	< 0,1

### Microbiology

	max ufc/g	method
<b>Aerobic mesofiles</b>	1.10 <sup>6</sup>	NF EN ISO 4833-1
<b>B. cereus</b>	100	BKR 23/06-02/10
<b>E. coli</b>	10	BRD 07/08-12/04
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<b>Enterobacterias</b>	1.10 <sup>4</sup>	NF EN ISO 4833-1
<b>Moulds</b>	1.10 <sup>4</sup>	NF V08/059
<b>Salmonella</b>	0	BRD 07/11-12/05
<b>Staphylococcus</b>	10	NF EN ISO 6888-2

### Toxicology

	max
<b>Cadmium</b>	0,2 ppm
<b>Lead</b>	0,2 ppm
<b>Arsenic</b>	0,03 ppm
<b>Mercury</b>	0,005 ppm
<b>Total Aflatoxines</b>	4 ppb
<b>Aflatoxine B1</b>	2 ppb
<b>Ochratoxine A</b>	1 ppb
<b>Deoxinivavenol (DON)</b>	750 ppb
<b>Zearalenone</b>	75 ppb



# Organic Flours

## Specifications



CCPAE: CT-004020 CE



### Refined

### Wholegrain

	min	max	target	min	max	target
--	-----	-----	--------	-----	-----	--------

<b>Extraction (%)</b>	68	72	70	85	95	90
<b>W</b>	70		140	40		80
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<b>Texture</b>	Soft, lumpy			Soft, with bran particles		
<b>Color</b>	Golden yellow			Ocre, amber		
<b>Taste</b>	not rancid, acid or bitter			not rancid, acid or bitter		



# Organic Flours

## Nutritional Compositions



CCPAE: CT-004020 CE



### Nutritional Composition

Refined      Wholegrain

<b>Energy (KJ-Kcal)</b>	1500 - 350	1500 - 350
<b>Carbohydrates (%)</b>	74	67
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### Microbiology

max ufc/g      method

<b>Aerobic mesofiles</b>	1.10 <sup>6</sup>	NF EN ISO 4833-1
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### Toxicology

max

<b>Cadmium</b>	0,2 ppm
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<b>Deoxinivavenol (DON)</b>	750 ppb
<b>Zearalenone</b>	75 ppb





# Quality Control

Seed, Grains, Malts, Flours

CATEGORY	ANALYSIS							FREQUENCY	WHO
	Purity (%)	Germination (%)	Specify Weight (Kg/hL)	Protein (%)	Broken grains (%)	Baking parameters	Malting parameters		
 Seeds	✓	✓	✓	✓	✓			Every lot	Vivagran
 Grains	✓	✓	✓	✓	✓	✓		Every lot	Vivagran
	 ✓	✓	✓	✓	✓	✓	✓	✓	Every lot
 Malts	✓	✓	✓	✓	✓		✓	Every lot	Maltster
 Refined Flours							✓	Every lot	Miller
 Wholegrain Flours							✓	Every lot	Miller
 Malt Flours							✓	Every lot	Maltster

Additional analysis are available on demand of the licensees and customers.

# Traceability

At Vivagran, we take pride in our **commitment to traceability**, ensuring that 100% of our Tritordeum seed and grain production is fully traceable throughout the entire value chain. Our traceability protocol is based on assigning a **unique lot number to each batch**, enabling our valued partners to easily identify the origins of the materials they trade.

Each lot number encapsulates vital information, providing comprehensive insight into the product's journey. It includes nine key pieces of data: the year of harvest, species, variety, treatment details, lot number, country of origin, class, final application, and type of material. This meticulous record-keeping allows for precise tracking and verification at every stage, ensuring transparency, quality assurance, and accountability in our supply chain.

With our robust traceability protocol, partners can confidently trace the origin of Tritordeum products, uphold quality standards, and make informed decisions, ultimately contributing to a sustainable and trustworthy agricultural ecosystem.

Below is presented an example of unique lot number:

Fields:

1	2	3	4	5	6	7	8	9
2	3	T	T	B	U	A	F	S
0	1	G	R	0	6	M	O	G
-E								

- 23** = 2023 harvest
- TT** = Tritordeum
- BU** = Bulel
- AFS** = Alfa Seeds
- 01** = treated
- GR** = Greece
- 06** = other
- MO** = Milling
- GC-E** = Conventional grain

For more information about the codification system, please contact: [evassiliadis@vivagran.nl](mailto:evassiliadis@vivagran.nl)



# Complaints

## Restrictions

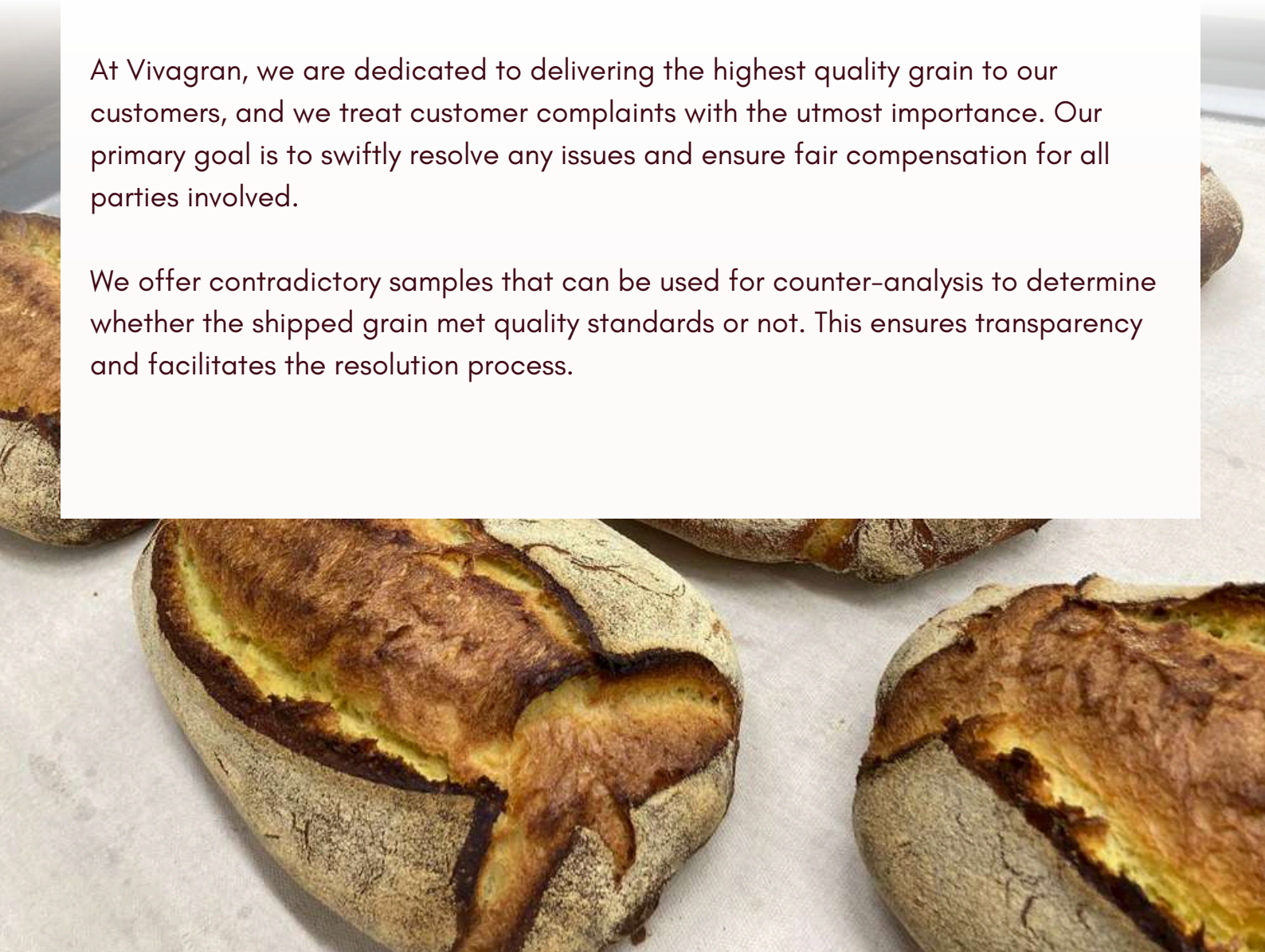
Customers are required to communicate any complaints regarding physicochemical parameters (such as specific weight, protein content, impurity levels, enzymatic activity, etc.) **within 48 hours of receiving the goods**. A detailed description and analysis of the grain (if necessary) must be provided to Vivagran.

For complaints related to microbiology, toxicology, heavy metals, and pesticides, an extended timeframe of 7 days is allowed due to the duration required to conduct such analyses.

## Resolutions

At Vivagran, we are dedicated to delivering the highest quality grain to our customers, and we treat customer complaints with the utmost importance. Our primary goal is to swiftly resolve any issues and ensure fair compensation for all parties involved.

We offer contradictory samples that can be used for counter-analysis to determine whether the shipped grain met quality standards or not. This ensures transparency and facilitates the resolution process.



# IP, GMO, Declaration, Allergens

## Intellectual Property

Vivagran holds an exclusive license granted by the Spanish Research Council CSIC in May 2006, authorizing the commercial exploitation of Tritordeum. Since assuming responsibility from the CSIC in 2006, VIVAGRAN has maintained rights over all Tritordeum germplasm and has been actively involved in funding and managing the breeding program.

In the European Union, Vivagran has successfully registered two Tritordeum varieties with the CPVO (Community Plant Variety Office): Aucan in 2013 and Bulel in 2015.

Additionally, Vivagran currently oversees a group of advanced breeding lines in the final stages of evaluation before registration. This ongoing dedication underscores our commitment to advancing Tritordeum cultivation and innovation in agriculture.

## GMO Statement

Tritordeum has been obtained through traditional inter-species breeding technique, and under no circumstances has gone through genetic modifications as defined by Regulations 1829/2003/EU and 1830/2003/EU.

This technique is described in the Plant Breeding Technique guide published in 2015 by the FiBL (<https://www.fibl.org>).

## Label Declaration

Tritordeum is a combination of wheat and barley, and therefore, to facilitate the understanding for end consumers, it is recommended to declare it as such:

### **Tritordeum (WHEAT, BARLEY)**

The scientific name is: x Tritordeum martinii A. Pujadas (Poaceae) nothosp. nov

## Allergens

The unique allergen present in Tritordeum is GLUTEN.



**vivagran**

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