ANALYTICAL PROTOCOL FOR EXTRA VIRGIN OLIVE OIL (EVOO)

TrustyFood (TF) analytical protocols are defined for each specific food matrix and are based on the full application of current European legislation, supplemented by additional analytical criteria specifically designed to assess product safety, purity and quality.

How to Read the TrustyFood (TF) Analytical Protocol

For each food matrix, the TrustyFood protocol fully incorporates all contaminants and requirements established by the applicable European legislation.

These requirements are supplemented by additional analytical parameters selected on the basis of scientific evidence and their specific relevance to the food matrix under consideration, with the objective of ensuring a higher level of consumer protection.

Contaminants that are not relevant to the specific food matrix are not included in the tables, while all applicable European regulatory requirements remain fully in force.

What LOQ Means

LOQ (Limit of Quantification) is the lowest concentration at which a substance can be reliably quantified by the analytical method used.

Values below the LOQ cannot be quantified with sufficient analytical certainty.

Why TrustyFood Applies More Stringent Criteria Than EU Limits

The limits established by European legislation define the legal compliance of a food product, but do not constitute a criterion for qualitative selection.

TrustyFood therefore applies more stringent criteria aimed at selecting batches characterized by the highest achievable levels of safety, purity and control, as specified in the individual sections of this protocol.

Note: n.a. = not applicable under EU legislation for the specific food matrix being analyzed.

NUTRITIONAL ANALYSIS

Parameter	Significance
Energy (kcal / kJ)	Caloric content of the oil, derived almost entirely from fats
Total fats	Total amount of lipids present in the oil
Saturated fatty acids	Lipid fraction considered less favorable from a cardiovascular perspective
Monounsaturated fatty acids	Main lipid fraction of extra virgin olive oil, rich in oleic acid and associated with metabolic benefits
Polyunsaturated fatty acids	Essential fatty acids that are more susceptible to oxidation

PARAMETRI QUALITATIVI E SOGLIE DI ECCELLENZA TRUSTYFOOD

Parametro	Significato del parametro	Valore di eccellenza
Acido oleico nel profilo degli acidi grassi (%)	Indica la qualità della frazione lipidica e la stabilità ossidativa dell'olio	≥ 72 %
Acidità libera (% acido oleico)	Misura il grado di degradazione delle olive prima della spremitura	≤ 0,20 %
Numero di perossidi (meq O_2/kg)	Indica l'ossidazione primaria dell'olio	≤ 8
K232	Assorbimento UV legato ai prodotti iniziali di ossidazione	≤ 1,80
K270	Assorbimento UV legato a ossidazione avanzata o raffinazione	≤ 0,15
ΔK	Indice di eventuale miscelazione o raffinazione	≤ 0,005
Polifenoli totali mg/kg	Composti antiossidanti naturali responsabili di stabilità e benefici salutistici	≥ 250

Parametro	Significato del parametro	Valore di eccellenza
Cere mg/kg	Indicatori di possibili aggiunte di oli di sansa o lavorazioni non corrette	≤ 80
Steroli totali mg/kg e composizione sterolica	Verifica chimica di autenticità botanica e assenza di adulterazioni	Conformità ai limiti UE per olio EVO e profilo compatibile con sola oliva
Alcoli alifatici mg/kg	Indicatori di eventuale raffinazione o presenza di oli non vergini	Valori entro i limiti UE per olio EVO non raffinato
Panel test ufficiale	Valutazione sensoriale di difetti e intensità del fruttato	Difetti = 0; Fruttato ≥ 5

QUALITY PARAMETERS AND TRUSTYFood EXCELLENCE THRESHOLDS

Parameter	Significance	Excellence Threshold
Oleic acid in the fatty acid profile (%)	Indicates the quality of the lipid fraction and the oxidative stability of the oil	≥ 72%
Free acidity (% oleic acid)	Measures the degree of olive degradation prior to extraction	≤ 0.20%
Peroxide value (meq O_2/kg)	Indicates primary oxidation of the oil	≤ 8
K232	UV absorbance associated with primary oxidation products	≤ 1.80
K270	UV absorbance associated with advanced oxidation or refining	≤ 0.15
ΔK	Indicator of possible blending or refining	≤ 0.005
Total polyphenols (mg/kg)	Natural antioxidant compounds responsible for stability and health benefits	≥ 250
Waxes (mg/kg)	Indicators of possible pomace oil addition or improper processing	≤ 80

Total sterols (mg/kg) and sterol composition	Chemical verification of botanical authenticity and absence of adulteration	Compliance with EU limits for EVOO and a profile consistent with olive oil only
Aliphatic alcohols (mg/kg)	Indicators of possible refining or the presence of non-virgin oils	Values within EU limits for unrefined EVOO
Official panel test	Sensory assessment of defects and fruitiness intensity	Defects = 0; Fruitiness ≥ 5

METALS	LOQ mg/kg	UE Limit mg/kg	Trustyfood Limit mg/kg
Lead	0,005	0,2	0,1
Cadmium	0,005	0,1	0,06
Arsenic (sum As III e As IV)	0,005	n.a.	0,15
Copper	0,005	n.a.	6
Cromium	0,005	n.a.	0,050
Nickel	0,005	n.a.	0,2
Iron	0,005	n.a.	2

NATURAL TOXINS	LOQ mg/kg	UE Limit mg/kg	Trustyfood Limit mg/kg
Erucic acid	100	20000	5000

PESTICIDES

The selected batch will undergo multi-residue screening using accredited analytical methods (LC-MS/MS and GC-MS/MS), covering more than 500 active substances and their relevant metabolites, in accordance with the Maximum Residue Levels (MRLs) established by Regulation (EU) No. 396/2005 and its subsequent amendments.
TrustyFood applies more stringent criteria than regulatory compliance alone and rejects batches in which pesticide residues are detected.

FOSFONATE COMPOUNDS (FOSETYL-AL)	LOQ mg/kg	UE Limit mg/kg	Trustyfood Limit mg/kg*
Fosetyl (ethyl hydrogen phosphonate)	0,01	n.a.	LOQ
Fosetyl-Al (sum of Fosetyl, phosphonic acid and their salts, expressed as Fosetyl)	0,01	n.a.	LOQ
Phosphonic acid (phosphorous acid), expressed as Fosetyl	0,01	n.a.	LOQ
Phosphorous acid and its salts, expressed as phosphorous acid	0,0075	n.a.	LOQ

* Any result ≥ LOQ results in batch rejection.

MOSH / MOAH	LOQ µg/kg	UE Limit µg/kg	Trustyfood Limit µg/kg *
MOSH (Mineral Oil Saturated Hydrocarbons)	500	n.a.	2000
MOAH (Mineral Oil Aromatic Hydrocarbons)	500	n.a.	LOQ

* Any result ≥ LOQ results in batch rejection.

PHTHALATES	LOQ µg/kg	UE Limit µg/kg	Trustyfood Limit µg/kg
DEHP	20	n.a.	50
DBP	20	n.a.	50
BBP	20	n.a.	50
DINP	20	n.a.	50

BISPHENOLS	LOQ µg/kg	UE Limit µg/kg	Trustyfood Limit µg/kg *
Bisphenol A (BPA)	2	n.a.	LOQ
Bisphenol S (BPS)	2	n.a.	LOQ

* Any result ≥ LOQ results in batch rejection.

PERFLUOROALKYL SUBSTANCES (PFAS)

Given the current widespread presence of PFAS in the environment, it is unrealistic to expect their complete absence in all food matrices.

TrustyFood accepts only batches with PFAS levels among the lowest reasonably achievable for the specific food matrix under consideration. Priority is given to sources and supply chains subject to lower environmental pressure, while actively seeking products cultivated in areas with low PFAS occurrence, with the objective of progressing toward their complete absence.

PERFLUOROALKYL SUBSTANCES	LOQ µg/kg	UE Limit µg/kg	Trustyfood Limit µg/kg
Perfluorobutanoic acid (PFBA)	0,5	n.a.	1
Perfluorododecanesulfonic acid (PFDoDS)	0,05	n.a.	0,1
Perfluorononanesulfonic acid (PFNS)	0,05	n.a.	0,1
Perfluorooctanesulfonic acid (PFOS)	0,05	n.a.	0,1
Perfluoropentanesulfonic acid (PFPS)	0,05	n.a.	0,1
Perfluorotridecanesulfonic acid (PFTrDS)	0,05	n.a.	0,1
Perfluoroundecanesulfonic acid (PFUnDS)	0,05	n.a.	0,1
Perfluorooctanesulfonamide (FOSA)	0,05	n.a.	0,1
Perfluorodecanoic acid (PFDA)	0,05	n.a.	0,1
Perfluorododecanoic acid (PFDoDA)	0,05	n.a.	0,1
Perfluoroheptanoic acid (PFHpA)	0,05	n.a.	0,1
Perfluorohexanoic acid (PFHxA)	0,05	n.a.	0,1
Perfluorononanoic acid (PFNA)	0,05	n.a.	0,1
Perfluorooctanoic acid (PFOA)	0,05	n.a.	0,1
Perfluoropentanoic acid (PFPeA)	0,05	n.a.	0,1
Perfluorotetradecanoic acid (PFTeDA)	0,05	n.a.	0,1
Perfluorotridecanoic acid (PFTrDA)	0,05	n.a.	0,1
Perfluoroundecanoic acid (PFUnDA)	0,05	n.a.	0,1
Perfluorobutanesulfonic acid (PFBS)	0,05	n.a.	0,1
Perfluorodecanesulfonic acid (PFDS)	0,05	n.a.	0,1
Perfluoroheptanesulfonic acid (PFHpS)	0,05	n.a.	0,1
Perfluorohexanesulfonic acid (PFHxS)	0,05	n.a.	0,1
Sum of PFOS, PFOA, PFNA and PFHxS			0,2

POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)	LOQ µg/kg	UE Limit µg/kg	Trustyfood Limit µg/kg*
Benzo[a]anthracene	2	n.a.	LOQ
Benzo[a]pyrene	2	n.a.	LOQ
Benzo[b]fluoranthene	2	n.a.	LOQ
Benzo[j+k]fluoranthene	2	n.a.	LOQ
Benzo[e]pyrene	2	n.a.	LOQ
Benzo[g,h,i]perylene	2	n.a.	LOQ
Chrysene	2	n.a.	LOQ
Dibenzo[a,e]pyrene	2	n.a.	LOQ
Dibenzo[a,i]pyrene	2	n.a.	LOQ
Dibenzo[a,h]pyrene	2	n.a.	LOQ
Dibenzo[a,l]pyrene	2	n.a.	LOQ
Dibenzo[a,h]anthracene	2	n.a.	LOQ
Indeno[1,2,3-c,d]pyrene	2	n.a.	LOQ
Pyrene	2	n.a.	LOQ
Acenaphthene	2	n.a.	LOQ
Acenaphthylene	2	n.a.	LOQ
Anthracene	2	n.a.	LOQ
Phenanthrene	2	n.a.	LOQ
Fluoranthene	2	n.a.	LOQ
Fluorene	2	n.a.	LOQ
Naphthalene	2	n.a.	LOQ

* Any result ≥ LOQ results in batch rejection.

BTEX	LOQ µg/kg	UE Limit µg/kg	Trustyfood Limit µg/kg*
Benzene	5	n.a.	LOQ
Toluene	5	n.a.	LOQ
Ethylbenzene	5	n.a.	LOQ
m-Xylene	5	n.a.	LOQ
o- + p Xylene	5	n.a.	LOQ
Styrene	5	n.a.	LOQ

* Any result ≥ LOQ results in batch rejection.

AOX – HALOGENATED ORGANIC COMPOUNDS	LOQ µg/kg	UE Limit µg/kg	Trustyfood Limit µg/kg*
Chloromethane	2	n.a.	LOQ
Chloroethane	2	n.a.	LOQ
Vinyl chloride	2	n.a.	LOQ
1,3-Dichloroethylene	2	n.a.	LOQ
1,1-Dichloroethylene	2	n.a.	LOQ
cis-1,2-Dichloroethylene	2	n.a.	LOQ
trans-1,2-Dichloroethylene	2	n.a.	LOQ
Dichloromethane (methylene chloride)	2	n.a.	LOQ
1,1-Dichloroethane	2	n.a.	LOQ
1,2-Dibromoethane	2	n.a.	LOQ
1,2-Dichloropropane	2	n.a.	LOQ
Dibromochloroethane	2	n.a.	LOQ
Bromodichloromethane	2	n.a.	LOQ
Trichloromethane	2	n.a.	LOQ
1,1,1-Trichloroethane	2	n.a.	LOQ
1,1,2-Trichloroethane	2	n.a.	LOQ
1,1,1,2-Tetrachloroethane	2	n.a.	LOQ
1,1,2,2-Tetrachloroethane	2	n.a.	LOQ
Tetrachloroethylene	2	n.a.	LOQ
Carbon tetrachloride	2	n.a.	LOQ
Hexachlorobutadiene	2	n.a.	LOQ
Chlorobenzene	2	n.a.	LOQ
1,2-Dichlorobenzene	2	n.a.	LOQ
1,3-Dichlorobenzene	2	n.a.	LOQ
1,4-Dichlorobenzene	2	n.a.	LOQ
1,2,3-Trichlorobenzene	2	n.a.	LOQ
1,2,4-Trichlorobenzene	2	n.a.	LOQ
1,3,5-Trichlorobenzene	2	n.a.	LOQ

* Any result ≥ LOQ results in batch rejection.

Note: In low-fat plant-based food matrices, where dioxin and PCB contamination is expected to be non-detectable, TrustyFood requires absence at the analytical limit of quantification (LOQ).

In vegetable oils, where the environmental presence of these contaminants is now ubiquitous and the production of completely contaminant-free fats is no longer considered realistic, TrustyFood applies a minimization approach based on limits that are more stringent than those established by European legislation.

NON-DIOXIN-LIKE POLYCHLORINATED BIPHENYLS (NDL-PCBs)	LOQ ng/g	UE Limit ng/g	Trustyfood Limit ng/g *
2,2',5-Trichlorobiphenyl (BZ #18)	0,04	n.a.	LOQ
2,4',5-Trichlorobiphenyl (BZ #31)	0,04	n.a.	LOQ
2,4,4'-Trichlorobiphenyl (BZ #28)	0,04	n.a.	LOQ
2,2',5,5'-Tetrachlorobiphenyl (BZ #52)	0,04	n.a.	LOQ
2,2',3,5'-Tetrachlorobiphenyl (BZ #44)	0,04	n.a.	LOQ
2,2',3,5',6-Pentachlorobiphenyl (BZ #95)	0,04	n.a.	LOQ
2,2',4,5,5'-Pentachlorobiphenyl (BZ #101)	0,04	n.a.	LOQ
2,2',4,4',5-Pentachlorobiphenyl (BZ #99)	0,04	n.a.	LOQ
3,4,4',5-Tetrachlorobiphenyl (BZ #81)	0,04	n.a.	LOQ
3,3',4,4'-Tetrachlorobiphenyl (BZ #77)	0,04	n.a.	LOQ
2,3,3',4',6-Pentachlorobiphenyl (BZ #110)	0,04	n.a.	LOQ
2,2',3,5,5',6-Hexachlorobiphenyl (BZ #151)	0,04	n.a.	LOQ
2',3,4,4',5-Pentachlorobiphenyl (BZ #123)	0,04	n.a.	LOQ
2,2',3,4',5',6-Hexachlorobiphenyl (BZ #149)	0,04	n.a.	LOQ
2,3',4,4',5-Pentachlorobiphenyl (BZ #118)	0,04	n.a.	LOQ
2,3,4,4',5-Pentachlorobiphenyl (BZ #114)	0,04	n.a.	LOQ
2,2',3,4',5,5'-Hexachlorobiphenyl (BZ #146)	0,04	n.a.	LOQ
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ #153)	0,04	n.a.	LOQ
2,3,3',4,4'-Pentachlorobiphenyl (BZ #105)	0,04	n.a.	LOQ
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ #138)	0,04	n.a.	LOQ
3,3',4,4',5-Pentachlorobiphenyl (BZ #126)	0,04	n.a.	LOQ
2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ #187)	0,04	n.a.	LOQ
2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ #183)	0,04	n.a.	LOQ
2,2',3,3',4,4'-Hexachlorobiphenyl (BZ #128)	0,04	n.a.	LOQ
2,3',4,4',5,5'-Hexachlorobiphenyl (BZ #167)	0,04	n.a.	LOQ
2,2',3,3',4',5,6-Heptachlorobiphenyl (BZ #177)	0,04	n.a.	LOQ
2,3,3',4,4',5-Hexachlorobiphenyl (BZ #156)	0,04	n.a.	LOQ
2,3,3',4,4',5'-Hexachlorobiphenyl (BZ #157)	0,04	n.a.	LOQ
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ #180)	0,04	n.a.	LOQ
3,3',4,4',5,5'-Hexachlorobiphenyl (BZ #169)	0,04	n.a.	LOQ
2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ #170)	0,04	n.a.	LOQ
2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ #189)	0,04	n.a.	LOQ
*Sum of the 6 indicator PCBs (ICES-6: 28, 52, 101, 138, 153 and 180)**		40	10

* ICES = International Council for the Exploration of the Sea

DIOXINS: PCDD - PCDF	LOQ = Analytical Limit of Quantification pg/g (of fat)	UE Limit (WHO-PCDD/F-TEQ) pg/g (of fat)	Trustyfood Limit pg/g (of fat)
2,3,7,8-TCDD	0,01	n.p.	n.p.
1,2,3,7,8-PECDD	0,01	n.p.	n.p.
1,2,3,4,7,8-HXCD	0,01	n.p.	n.p.
1,2,3,6,7,8-HXCDD	0,01	n.p.	n.p.
1,2,3,7,8,9-HXCDD	0,01	n.p.	n.p.
1,2,3,4,6,7,8-HPCDD	0,01	n.p.	n.p.
OCDD	0,01	n.p.	n.p.
2,3,7,8-TCDF	0,01	n.p.	n.p.
1,2,3,7,8-PECDF	0,01	n.p.	n.p.
2,3,4,7,8-PECDF	0,01	n.p.	n.p.
1,2,3,4,7,8-HXCDF	0,01	n.p.	n.p.
1,2,3,6,7,8-HXCDF	0,01	n.p.	n.p.
2,3,4,6,7,8-HXCDF	0,01	n.p.	n.p.
1,2,3,7,8,9-HXCDF	0,01	n.p.	n.p.
1,2,3,4,6,7,8-HPCDF	0,01	n.p.	n.p.
1,2,3,4,7,8,9-HPCDF	0,01	n.p.	n.p.
OCDF	0,01	n.p.	n.p.
Sum of dioxins (WHO-PCDD/F-TEQ, pg/g of fat)		0,75	0,5

DIOXIN-LIKE POLYCHLORINATED BIPHENYLS (DL-PCBs)	LOQ = Analytical Limit of Quantification pg/g (of fat)	EU Limit Sum of dioxins and dioxin-like PCBs pg WHO-PCDD/F-PCB-TEQ/g fat	TrustyFood Limit pg/g (fat basis)
3,4,4',5-Tetrachlorobiphenyl (BZ #81)	0,01	n.p.	n.p.
3,3',4,4'-Tetrachlorobiphenyl (BZ #77)	0,01	n.p.	n.p.
2',3,4,4',5-Pentachlorobiphenyl (BZ #123)	0,01	n.p.	n.p.
2,3,4,4',5-Pentachlorobiphenyl (BZ #114)	0,01	n.p.	n.p.
2,3,3',4,4'-Pentachlorobiphenyl (BZ #105)	0,01	n.p.	n.p.
3,3',4,4',5-Pentachlorobiphenyl (BZ #126)	0,01	n.p.	n.p.
2,3',4,4',5,5'-Hexachlorobiphenyl (BZ #167)	0,01	n.p.	n.p.
2,3,3',4,4',5-Hexachlorobiphenyl (BZ #156)	0,01	n.p.	n.p.
2,3,3',4,4',5'-Hexachlorobiphenyl (BZ #157)	0,01	n.p.	n.p.
3,3',4,4',5,5'-Hexachlorobiphenyl (BZ #169)	0,01	n.p.	n.p.
2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ #189)	0,01	n.p.	n.p.
Sum of dioxins + PCB DL (WHO-PCDD/F-PCB-TEQ)		1,25	0,3

MICROBIOLOGICAL NOTE

Oils are an anhydrous lipid matrix with extremely low water activity (aw ≈ 0.6), a condition that prevents microbial growth.

Microorganisms may occasionally be present as passive contaminants; however, they are unable to grow or multiply within the product.