



DOCUMENT NAME:

Analysis report

■ **PURPOSE OF THE DOCUMENT:**

determination of microbiological and chemical quality indicators of cold-pressed hemp oil Leodar

■ **REGISTRATION NUMBER:**

22005275-02-1

■ **DATE OF ENTRY INTO FORCE OF THE DOCUMENT:**

30.09.2022

■ **VALIDITY PERIOD OF THE DOCUMENT:**

■ **NAME OF THE CERTIFYING AUTHORITY:**

Institut Kurz GmbH, Germany

■ **KEYWORDS IN THE DOCUMENT:**

bacteria, E. coli, acid value, iodine number, acid, gluten, omega, mercury, cannabinal, tetrahydrocannabinol

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La

Cologne, 30.09.2022

Page 1 of 8

Analysis report 22005275-02-1

Sample name: Hemp Seed Oil
Sample number: 22005275
Arrival of sample: 10.08.2022, 09:30 via courier
Number of samples: 2
Sent to us by: see above
Sample temperature [°C]: 20
Package: Dark glass container with a screw cap and colorfully printed adhesive labels
Scope of analysis: microbiological and chemical results
Charge / Lot: O0000RA53B and O000TA53D
Sample description: Hemp Seed Oil
cold pressed
250 ml
Comment: Analysis performed with a mixed sample from both bottles.
Start of analysis: 10.08.2022
End of analysis: 30.08.2022

Basis of evaluation:

- Regulation (EC) No 178/2002, last amended on June 20, 2019
- German food law, last amended on September 27, 2021
- Regulation (EC) No 1881/2006, last amended on April 12, 2022
- Regulation (EC) No 396/2005, last amended on August 26, 2022
- EU Pesticides Database, in the current version
- Regulation (EC) No 2073/2005, last amended on February 14, 2020
- German Society for Fat Science e.V.: Physical properties of fats and oils (http://www.dgfett.de/material/physikalische_eigenschaften.pdf)
- European Industrial Hemp Association: Hemp Seeds and Hemp Oil as Foods (<http://eiha.org/media/2014/10/Hemp-Seeds-and-Hemp-Oil-as-Food-2009.pdf>)



to report 22005275-02-1
Microbiological analysis

Parameter	Result	Unit	Method
Aerobic mesophilic plate count	< 100	cfu/g	IK5971, ASU L00.00-88/2 (2015-06)++
Enterobacteriaceae	< 100	cfu/g	IK5973, ASU L06.00-24 (1987-11) mod.++
Escherichia coli	< 10	cfu/g	IK5975, ASU L00.00-132/2 (2010-09)++
Coliform germs	< 10	cfu/g	IK5976, ASU L01.00-3 (1987-03) mod.++
presumptive Bacillus cereus	< 100	cfu/g	IK5977, ASU L01.00-72 (2011-01) mod.++
Coagulase-positive Staphylococci	< 100	cfu/g	IK5978, ASU L00.00-55 (2004-12) mod.++
Yeast	< 100	cfu/g	IK5974, ASU L01.00-37 (1990-06) mod.++
Mould	< 100	cfu/g	IK5974, ASU L01.00-37 (1990-06) mod.++
Sulfite-reducing clostridia	< 10	cfu/g	IK5057, ASU L06.00-39 (1994-05)++
Salmonella spp.	not detected	in 25 g	IK5843, SALMA BIO12/41-03/17++

"<": value is equal to the limit of detection

Chemical results

Parameter	Result	Unit	Method
Water	0,394	g/100 g	IK0107, Karl-Fischer
Fat	100	g/100 g	IK0027, Weibull-Stoldt; version: 2022-05-10+
Acid value	1,97	mg KOH/g fat	IK0060, DGF C-VI 2, version: 2012+
Peroxide value	8,24	meq oxygen/kg fat	IK0059, DGF C-VI 6a, version: 2005+
Saponification value	196	mg KOH/g	IK6154, DGF C-V 3
Iodine value	141	g/100 g	IK5187, DGF C-V 11d (02)
Density	0,92203	g/ml	IK0074, Pycnometer, 20 °C
Butyric acid C4:0	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Caproic acid C6:0	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Caprylic acid C8:0	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID

to report 22005275-02-1

Parameter	Result	Unit	Method
Capric acid C10:0	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Undecensäure C11:0	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Lauric acid C12:0	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Tridecanoic acid C13:0	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Myristic acid C14:0	0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Myristoleic acid C14:1w5c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Pentadecanoic acid C15:0	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-10-pentadecenoic acid C15:1w5c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Palmitic acid C16:0	6,28	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Palmitoleic acid C16:1w7c	0,11	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Palmitelaidic acid C16:1w7t	< 0,01	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-7-hexadecenoic acid C16:1w9c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-9,12-hexadecadienoic acid C16:2w4c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-6, 9, 12-hexadecatrienoic acid C16:3w4c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Heptadecanoic acid C17:0	0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Heptadecenoic acid, cis isomers C17:1-cis	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Stearic acid C18:0	3,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Octadecenoic acid, cis isomers without C 18:1w9c, C18:1-cis	15,82	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
trans-octadecenoic acid C18:1-trans	0,02	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Oleic acid C18:1w9c	0,91	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
conjugated linoleic acid CLA C18:2-conj.	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Linoleic acid C18:2w6c	52,79	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Octadecadienoic acid, trans-C18:2w6-trans	0,13	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
alpha-linolenic acid C18:3w3c	15,35	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Octadecatrienoic acid, trans isomers C18:3w3-trans	0,06	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
gamma-linolenic acid C18:3w6c	2,21	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Stearidonic acid C18:4w3c	0,72	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Arachidic acid C20:0	1,02	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-11 eicosenoic acid, C20:1w9c	0,49	g/100 g fat	IK5738, ISO 12966 mod., GC-FID

to report 22005275-02-1

Parameter	Result	Unit	Method
Eicosenoic acid, cis isomers, without C20:1w9c, C20:1-cis	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-11,14-Eicosadiensäure C20:2w6c	0,07	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-11,14,17-Eicosatriensäure C20:3w3c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-8,11,14-Eicosatriensäure C20:3w6c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-8,11,14,17-Eicosatetraensäure C20:4w3c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Arachidonic acid C20:4w6c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-5,8,11,14,17-Eicosapentaenoic acid EPA C20:5w3c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Behenic acid C22:0	0,45	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Erucic acid C22:1w9c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Docosaenoic acid, cis isomers without C22:1w9c, C22:1-cis	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-13,16-Docosadiensäure C22:2w6c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-7,10,13,16-Docosatetraensäure C22:4w6c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-7,10,13,16,19-Docosapentaensäure C22:5w3c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-4,7,10,13,16-Docosapentaensäure C22:5w6c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
cis-4,7,10,13,16,19-docosaheptaenoic acid DHA C22:6w3c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Tricosanoic acid C23:0	0,07	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Lignoceric acid C24:0	0,19	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
Nervonic acid C24:1w9c	< 0,05	g/100 g fat	IK5738, ISO 12966 mod., GC-FID
saturated fatty acids	11,16	g/100 g	IK5738, ISO 12966 mod., GC-FID
monounsaturated fatty acids	17,33	g/100 g	IK5738, ISO 12966 mod., GC-FID
polyunsaturated fatty acids	71,14	g/100 g	IK5738, ISO 12966 mod., GC-FID
trans fatty acids	0,21	g/100 g	IK5738, ISO 12966 mod., GC-FID
omega-3-fatty acids	16,07	g/100 g	IK5738, ISO 12966 mod., GC-FID
omega-6-fatty acids	55,07	g/100 g	IK5738, ISO 12966 mod., GC-FID
Gluten	< 5	mg/kg	IK5988, ELISA
Lead	< 0,05	mg/kg	IK5552, ICP-MS
Cadmium	< 0,005	mg/kg	IK5552, ICP-MS
Arsenic	< 0,01	mg/kg	IK5552, ICP-MS
Mercury	< 0,01	mg/kg	IK5552, ICP-MS
Ochratoxin A	< 0,5	µg/kg	IK6041, LC-MS/MS

to report 22005275-02-1

Parameter	Result	Unit	Method
Deoxynivalenole DON	< 10	µg/kg	IK5788, LC-MS/MS
Aflatoxins (B1, B2, G1, G2) Sum	< 2,0	µg/kg	IK2350, UPLC-MS/MS
Aflatoxin B1	< 0,1	µg/kg	IK2350, UPLC-MS/MS
Zearalenone (ZEA)	< 10	µg/kg	IK5844, LC-MS/MS
Fumonisin B1	< 20	µg/kg	IK5845, LC-MS/MS
Fumonisin B2	< 20	µg/kg	IK5845, LC-MS/MS
Fumonisin summary	< 20	µg/kg	IK5845, LC-MS/MS
Pesticides	see below	mg/kg	IK5302, GC-MS/MS, IK5301, LC-MS/MS
Sum cannabidiol (CBD + CBDA)	< 0,01	g/100 g	IK5672, HPLC-DAD
Cannabidiol (CBD)	< 0,01	g/100 g	IK5672, HPLC-DAD
Cannabidiol carboxylic acid	< 0,01	g/100 g	IK5672, HPLC-DAD
Sum tetrahydrocannabinol (THC + THCA)	< 0,01	g/100 g	IK5672, HPLC-DAD
D9-tetrahydrocannabinol (D9THC)	< 0,01	g/100 g	IK5672, HPLC-DAD
Tetrahydrocannabinol carboxylic acid (THCA)	< 0,01	g/100 g	IK5672, HPLC-DAD
D8-tetrahydrocannabinol (D8THC)	< 0,01	g/100 g	IK5672, HPLC-DAD
Sum cannabigerol (CBG + CBGA)	< 0,01	g/100 g	IK5672, HPLC-DAD
Cannabigerol (CBG)	< 0,01	g/100 g	IK5672, HPLC-DAD
Cannabigerol carboxylic acid (CBGA)	< 0,01	g/100 g	IK5672, HPLC-DAD
Cannabinol (CBN)	< 0,01	g/100 g	IK5672, HPLC-DAD
Cannabichromen (CBC)	< 0,01	g/100 g	IK5672, HPLC-DAD
Tetrahydrocannabivarin (THCV)	< 0,01	g/100 g	IK5672, HPLC-DAD
Cannabidivarin (CBDV)	< 0,01	g/100 g	IK5672, HPLC-DAD
Cannabidivarin carboxylic acid (CBDVA)	< 0,01	g/100 g	IK5672, HPLC-DAD

"<": value is equal to the limit of quantification

The analysis results do apply exclusively to the specific samples analyzed.

The methods marked with "+" are accredited test methods. The tests marked with "++" were carried out at the accredited partner site. This report may only be reproduced unchanged and as a whole, not in part or modified.

Evaluation:
Detected pesticides

Imidacloprid: 0.018 mg/kg (± 0.009 mg/kg)

Lamda-cyhalothrin: 0.035 mg/kg (± 0.017 mg/kg)

Malathion (sum malathion and malaoxon expressed as malathion): 0.048 mg/kg (± 0.024 mg/kg).

Of which malathion: 0.048 mg/kg (± 0.024 mg/kg)

Pirimiphos-methyl: 0.011 mg/kg (± 0.005 mg/kg)

to report 22005275-02-1

Thiamethoxam: 0.026 mg/kg ($\pm$ 0.020 mg/kg)

Other pesticides tested: below the limit of quantification.

The following MRLs exist for hemp seeds:

Imidacloprid: 0.01 mg/kg

Lamda-cyhalothrin: 0.2 mg/kg

Malathion (sum malathion and malaoxon expressed as malathion): 0.02 mg/kg

Pirimiphos-methyl: 0.5 mg/kg

Thiamethoxam: 0.02 mg/kg

Considering the measurement uncertainty and the processing from hemp seeds to hemp oil (estimated oil content of hemp seeds 45 %), these limits are respected in the sample.

The density of the hemp oil and the amount of saturated and unsaturated fatty acids are within the scope of hemp seed oil, as is the percentage of the main fatty acids, according to data published by the German Society for Fat Science and the European Industrial Hemp Association.

The heavy metals lead, cadmium, arsenic and mercury were not detected.

The mycotoxins Ochratoxin A, Deoxynivalenole, Aflatoxins (B1, B2, G1, G2), Zearalenone, Fumonisin B1 and B2 were not detected.

No cannabinoids were detected.



Barbara Kulbach
Food Chemist

to report 22005275-02-1

Attachment



P1010782



P1010783

to report 22005275-02-1



1200x901_P1020162