Oat Lipid e

DATA PACK

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Oat Lipid

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Contents

Ceramide Content Analysis

QUANTITATIVE ANALYSIS

Ceramide content measurement was undertaken by using the sphingolipid analysis as described by Markham and Jaworski 2007:

Rapid measurement of sphingolipids from Arabidopsis thaliana by reversed-phase high-performance liquid chromatography coupled to electrospray ionization tandem mass spectrometry. Rapid Commun. Mass Spectrom. 21: 1304–1314.

RESULTS

The results indicate an average total ceramide content in Oat Lipid e of 1.49% of total lipids. Analysis of the ceramide species showed the following fractions:

Type	Skin Identical Ceramides Including Isomers	Skin Identical Ceramides Including Isomers and Analogs
NS	3.1%	23.3%
NP	35.1%	35.1%
EOH	6.3%	26.6%
AS	5.6%	11.9%
AP	3.2%	3.2%

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Lipid and Fatty Acid Profile Comparison

OIL COMPARISON

An analysis of the Lipid and Fatty Acid Profiles of some of the most commonly used cosmetic oils was undertaken and then compared to that of Oat Lipid E.

RESULTS

The results show that oat Lipid e is unique amongst the oils tested for containing a polar lipid fraction along with a balanced saturated, monounsaturated and polyunsaturated profile.

	Oat® Lipid e	Almond (Sweet)	Argan Oil	Canola	Daikon Radish Seed	Jojoba Golden	Macadamia Nut	Meadow Foam	Rosehip	Hemp	Wheat Germ	Safflower
Lipid Profile												
Neutral Lipids	90.00	98.6	96.5	97.2	96.4	97.7	98.1	98.8	96.4	95.6	92.4	97.2
Pigmented material	3.62	3.6	2.8	1.2	3.6	3.5	2.8	2.3	1.4	4.4	7.6	1.9
Polar lipids	6.38	0	0	0	0	0	0	0	0	0	0	0
Fatty Acid Profile												
Total Saturated	16.84	9.69	18.62	8.79	10.82	1.34	18.24	1.19	6.32	10.7	18.24	11.38
Total Mono-unsaturated	43.85	64.73	52	54.53	68.72	97.96	76.83	80.8	15.1	14.71	14.31	15.35
Total Poly-unsaturated	39.32	25.58	29.38	36.7	20.45	0.71	4.93	18.01	78.58	74.59	67.45	73.28

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Antioxidant Comparison

OIL COMPARISON

An analysis of the antoxidant content of some of the most commonly used cosmetic oils was undertaken and then compared to that of Oat Lipid E.

RESULTS

The results show that Oat lipid e contains potent natural antioxidants, including the tocotrienols, tocopherols, together with the alkyl phenolates, which are known to be as effective an antioxidant as Butylated hydroxytoluene (BHT).

	Tocotrienol **					Tocopherol **				
	Alpha	beta	gamma	delta	total	Alpha	beta	gamma	delta	total
Oat® Lipid e	379	25	56	17	477	131	18	2	2	153
Wheatgerm	2.5	8.2	0.24	-	11	191	65	tr	0.55	257
Coconut	3	0.17	0.64	0.1	4	0.2	tr	0.12	-	0.32
Corn	0.94	tr	1.1	0.26	2	18	1.1	44	2.2	65
Sesame	tr	-	0.34	-	tr	7.9	0.41	36	1.2	46
Walnut	tr	-	0.17	tr	tr	6.6	-	39	4.6	50
Linseed	-	-	-	-	-	1.2	tr	52	0.95	54
Sunflower	0.11	-	tr	0.27	tr	59	2.4	1.4	0.27	63
Rapeseed	-	-	-	-	-	24	tr	39	0.98	64
Camelina	-	-	-	-	-	3.8	0.09	72	1.3	77

** These typical levels of naturally occurring molecules may vary between batches.

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28-Day Comedogenicity Study

STUDY OBJECTIVES

A study was undertaken to assess the comedogenicity potential (the tendency of an ingredient or product to clog pores) of Oat Lipid e. The objective of the study was to evaluate whether Oat Lipid e caused non-inflamed lesions (comedones) or inflamed lesions when used regularly over a 28-day period.

STUDY DESCRIPTION

The study was a single-centre, open, controlled user study carried out by a group of thirty 18-40-year-old females.

Subjects were provided with Oat Lipid e to apply once each morning to the face during the 4-week study period. Oat Lipid e was worn for at least 8 hours each day and subjects recorded each application and removal in a diary.

Subjects had facial comedones (non-inflamed lesions – blackheads and whiteheads) and inflamed lesions (papules and pustules) counted at baseline and after 2 weeks and 4 weeks of product use. The assessor also analysed the full face for signs of dermal irritation and questioned the subjects regarding experiences of subjective irritation.

The output of the study therefore focused on three areas:

- Lesion Count
- Tolerance Assessment (Dermal Signs Trend)
- Subjective Tolerance Assessment

The study was independently performed for Oat Cosmetics by Alba Science Ltd between the 17th August and 15th September 2017.

LESION COUNT

At each assessment (Baseline, Day 14 and Day 28) a lesion count was undertaken by a trained assessor using a x4 magnification Northlight lamp. The lesion assessments were carried out by the same assessor at each time point.

Counts were made for:

- Number of blackheads (overall)
- Number of whiteheads (overall)
- Number of papules (overall)
- Number of pustules (overall)

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28-Day Comedogenicity Study

TOLERANCE ASSESSMENTS

At each assessment (Baseline, Day 14 and Day 28) the trained assessor assessed the full face for signs of dermal irritation (erythema, oedema and dryness). Each sign of dermal irritation was recorded using a 5-point scale:

- 0 = None
- 0.5 = Very slight
- 1 = Slight
- 2 = Moderate
- 3 = Severe

SUBJECTIVE TOLERANCE ASSESSMENTS

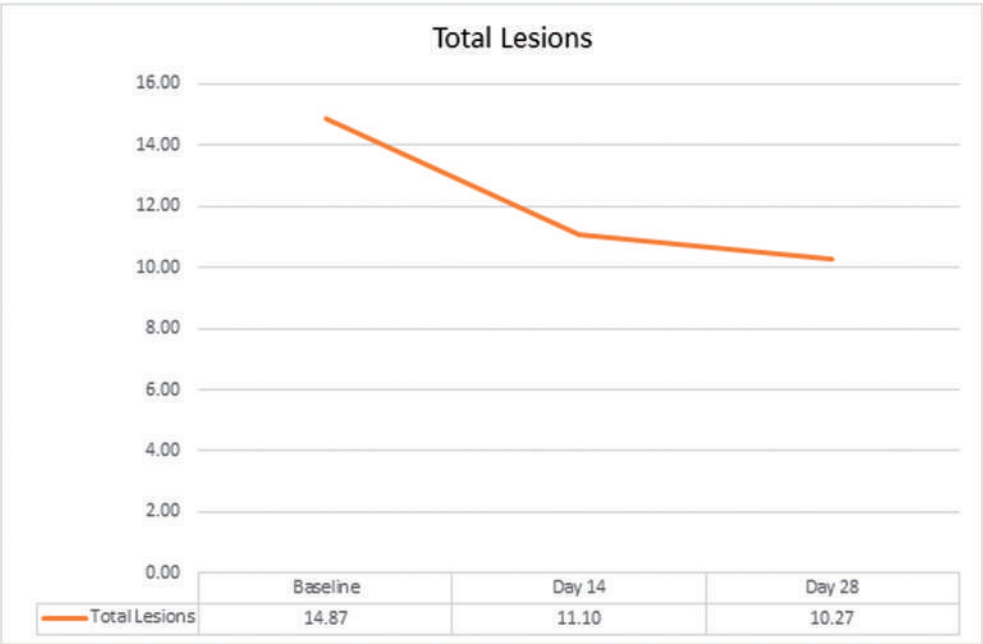
At each assessment (Baseline, Day 14 and Day 28) the subject was questioned by the trained assessor regarding experiences of subjective irritation on the face - stinging, tightness, itching, redness and warm/burning sensations.

At Day 0 (Baseline) the trained assessor reviewed a period of 7 days prior to Baseline with the subject; at Days 14 and 28 the assessment covered the period since the previous visit.

Each subjective tolerance parameter was recorded using a 5-point scale:

- 0 = None
- 0.5 = Very slight
- 1 = Slight
- 2 = Moderate
- 3 = Severe

LESION COUNT RESULTS



The above graph shows the mean scores for total lesions for the 28-day duration of the study.

Independently tested by Alba Science Ltd., 2017. Full report available upon request.

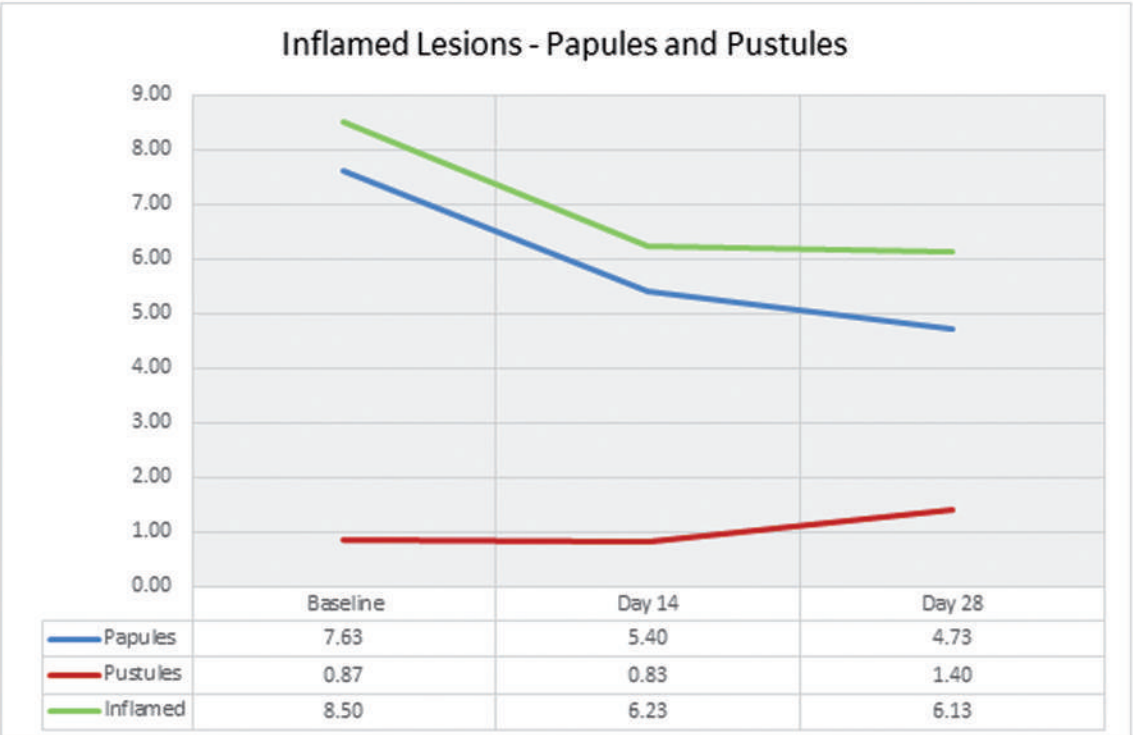
28-Day Comedogenicity Study

LESION COUNT RESULTS (CONT.)

The following table summarises the mean lesion counts recorded at Baseline, Day 14 and Day 28 for the 30 subjects included in the analysis.

Lesions							
	Papules	Pustules	Blackheads	Whiteheads	Inflamed	Non-inflamed	Total Lesions
Baseline	7.63	0.87	5.53	0.83	8.50	6.37	14.87
Day 14	5.40	0.83	4.30	0.57	6.23	4.87	11.10
Day 28	4.73	1.40	3.73	0.40	6.13	4.13	10.27
Change from Baseline							
Δ Day 14	-2.23	-0.03	-1.23	-0.27	-2.27	-1.50	-3.77
Δ Day 28	-2.90	0.53	-1.80	-0.43	-2.37	-2.23	-4.60
Percentage Change from Baseline							
Δ Day 14	-29.26%	-3.85%	-22.29%	-32.00%	-26.67%	-23.56%	-25.34%
Δ Day 28	-37.99%	61.54%	-32.53%	-52.00%	-27.84%	-35.08%	-30.94%

INFLAMED LESIONS



The above graph shows the mean scores for inflamed lesions (papules and pustules) for the 28-day duration of the study.

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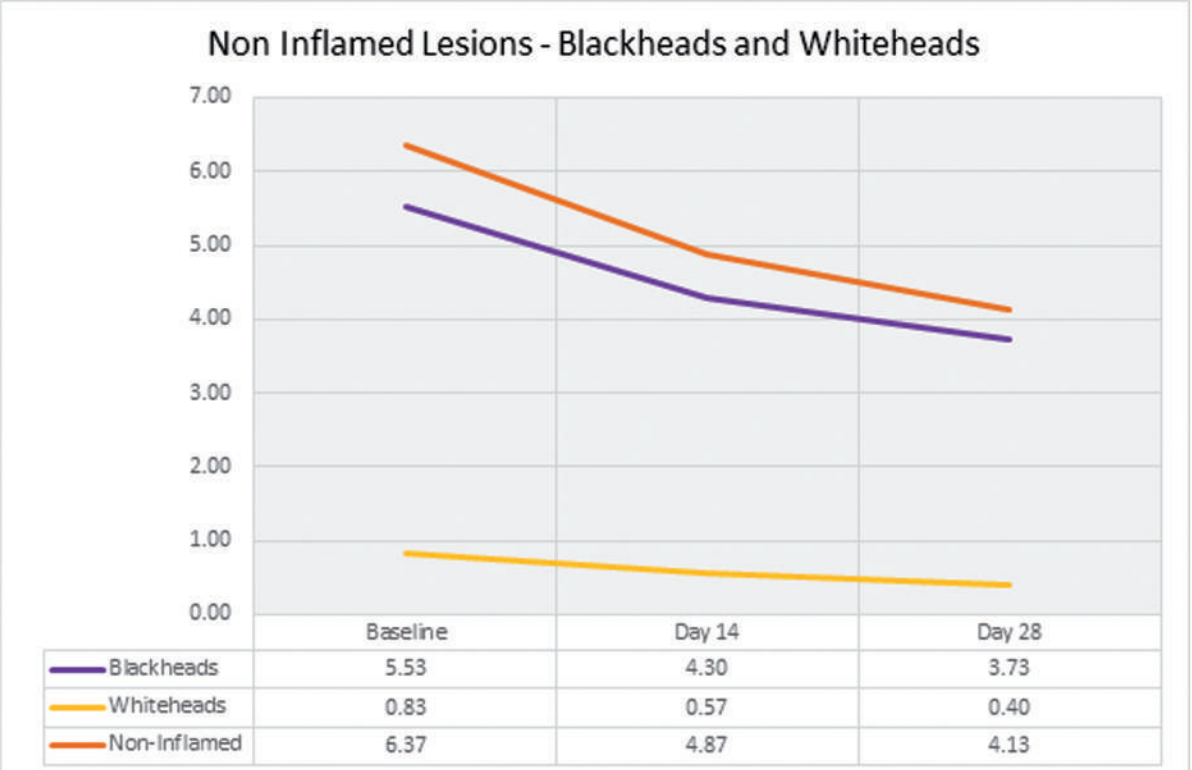
28-Day Comedogenicity Study

LESION COUNT RESULTS (CONT.)

NON-INFLAMED LESIONS



	Baseline	Day 14	Day 28
Blackheads	5.53	4.30	3.73
Whiteheads	0.83	0.57	0.40
Non-Inflamed	6.37	4.87	4.13

The above graph shows the mean scores for non-inflamed lesions (blackheads and whiteheads) for the 28-day duration of the study.

TOLERANCE ASSESSMENT RESULTS

DERMAL SIGNS TREND

The following table summarises the dermal signs recorded at Day 14 and Day 28 for the 30 subjects included in the analysis.

Dermal			
	Erythema	Oedema	Dryness
Baseline	0.22	0.00	0.23
Day 14	0.22	0.00	0.28
Day 28	0.22	0.00	0.20
Change from Baseline			
Δ Day 14	0.00	0.00	0.05
Δ Day 28	0.00	0.00	-0.03

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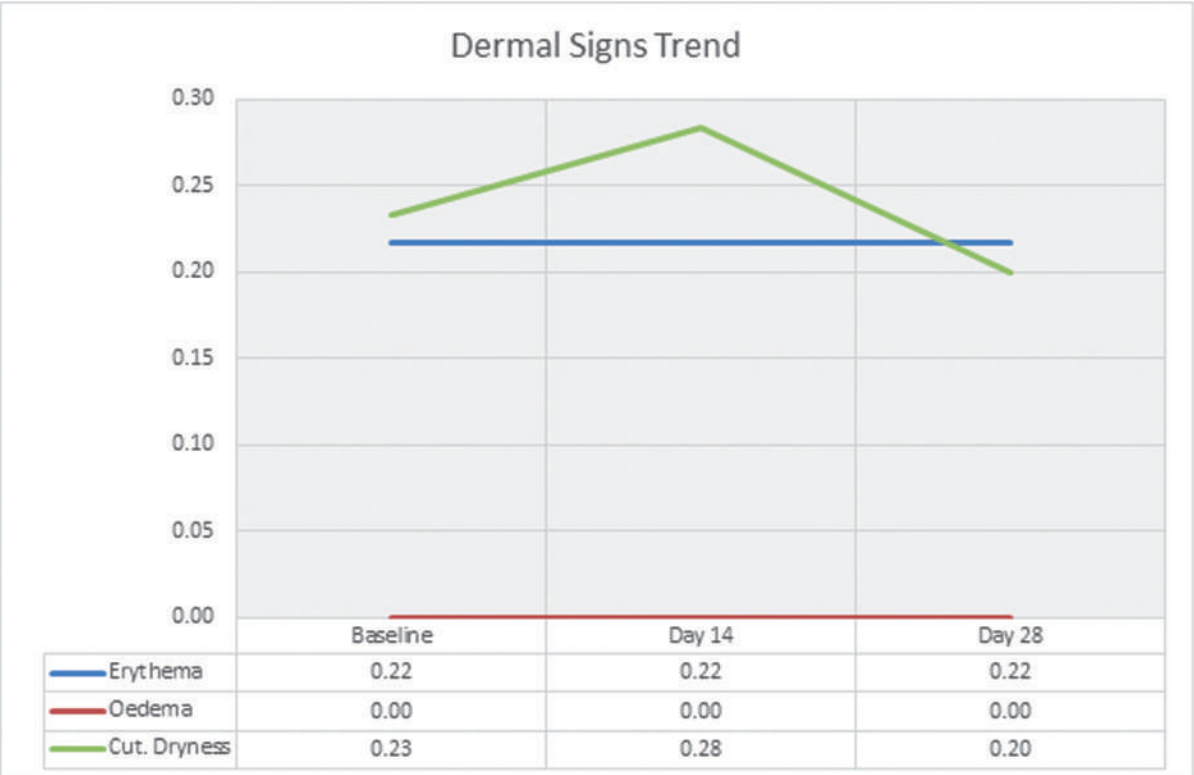
DERMAL SIGNS TREND (CONT.)



The above graph shows the mean scores for all the dermal signs for the 28-day duration of the study.

SUBJECTIVE TOLERANCE ASSESSMENT RESULTS

The following table summarises the subjective signs recorded at day 14 and day 28 for the 30 subjects included in the analysis.

Subjective					
	Stinging	Tightness	Itching	Redness	Warm/ Burning
Baseline	0.00	0.10	0.00	0.00	0.00
Day 14	0.00	0.03	0.00	0.00	0.00
Day 28	0.00	0.03	0.00	0.00	0.00
Change from Baseline					
Δ Day 14	0.00	-0.07	0.00	0.00	0.00
Δ Day 28	0.00	-0.07	0.00	0.00	0.00

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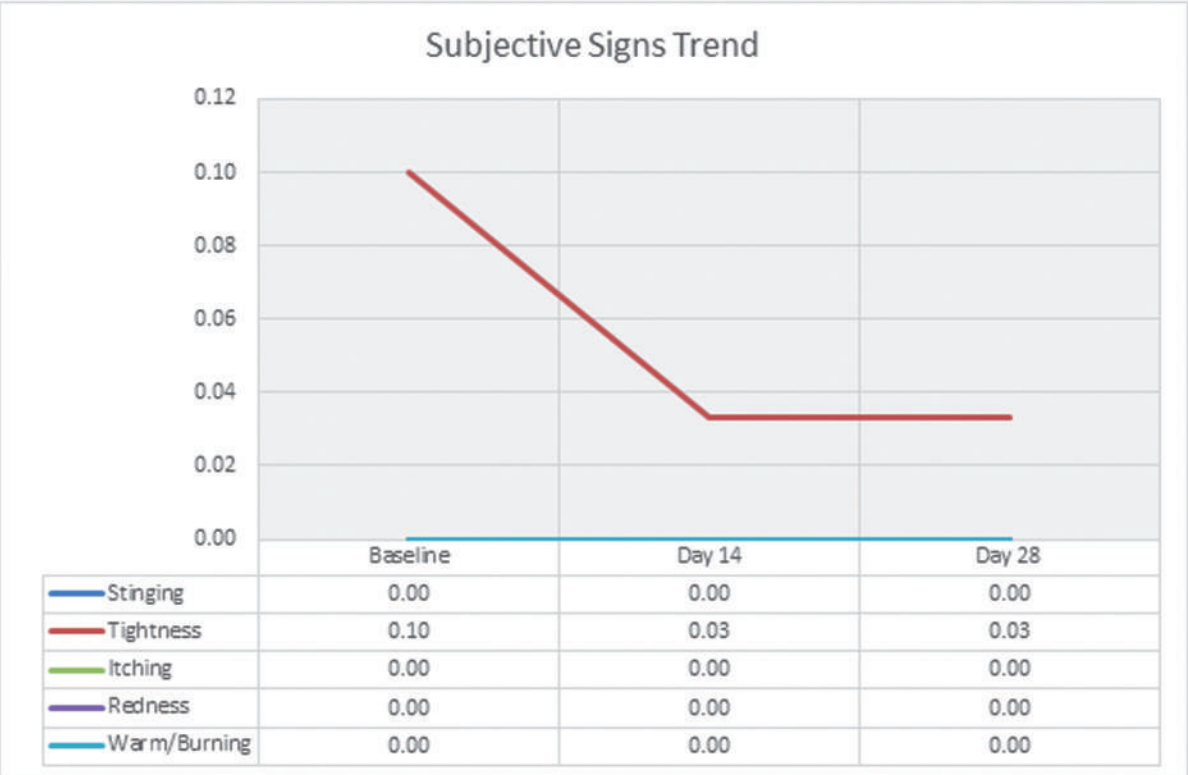
SUBJECTIVE TOLERANCE ASSESSMENT RESULTS (CONT.)



	Baseline	Day 14	Day 28
Stinging	0.00	0.00	0.00
Tightness	0.10	0.03	0.03
Itching	0.00	0.00	0.00
Redness	0.00	0.00	0.00
Warm/Burning	0.00	0.00	0.00

The above graph shows the mean scores for all the subjective signs for the 28-day duration of the study.

CONCLUSION

All lesion counts, except for pustules, decreased at the Day 28 post-baseline assessments.

Statistical significance was achieved in the following data sets:

- Reduction in Papules at Day 14 and 28
- Reduction in Blackheads at Day 14 and 28
- Reduction in Whiteheads at Day 14
- Reduction in Inflamed Lesions at Day 14 and 28
- Reduction in Non-Inflamed Lesions at Day 14 and 28
- Reduction in Total Lesions at Day 14 and 28

There were no statistically significant increases in any lesion counts at day 14 or day 28 of the study. Assessments made by the trained assessor showed a reduction in skin dryness, whilst subjects themselves felt a reduction in skin tightness when using Oat Lipid e.

These results categorically show Oat Lipid e to be non-comedogenic.

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Oxidative Stability Study

BACKGROUND

Oil rancidity is the result of the oxidation or hydrolysis of unsaturated fats into short chain aldehydes and ketones giving rise to an unpleasant odour and taste. It is generally expected that oils containing high levels of unsaturated fats are less oxidatively stable than those with lower levels.

STUDY DESCRIPTION

A study was undertaken to assess and compare the oxidative stability of Oat Lipid e against two other oils rich in unsaturated fatty acids - Sunflower Oil and Wheat Germ Oil.

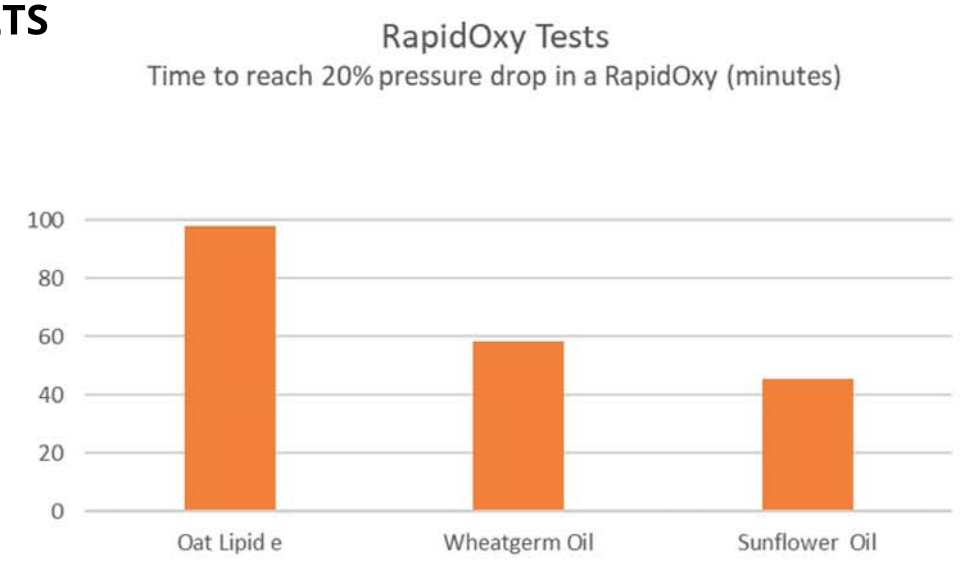
Oil	Approx. Unsaturated Fatty Acid Content
Oat Lipid e	83%
Wheat Germ Oil	82%
Sunflower Oil	91%

The stability was assessed using a RapidOxy device. The RapidOxy is based on Anton Paar's patented measuring principle of ASTM D7545, a well-established method to test the oxidation stability. Under this test method, samples are sealed into the test cell, pressurised with pure oxygen and heated. This initiates a very fast oxidation process. A defined pressure drop determines the end of the test. The test duration is directly related to the oxidation stability of the sample.

Oil samples (10ml) were pipetted into a glass dish that was placed in the sample chamber of a RapidOxy. The sample chamber was filled with oxygen to an initial pressure of 7 bar and heated to the set temperature (140°C). The oxidative stability of the sample was determined by recording the time taken for the pressure to decrease by 20%.

The result reported is the mean value of duplicate analysis.

RESULTS



The results demonstrated that Oat Lipid e was significantly more stable than Wheat Germ Oil, with Sunflower Oil being the least stable.

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STABILIZING EFFECT OF OAT LIPID E ON A LESS STABLE OIL

In a further experiment, using the same methodology, 3% Oat Lipid e was added to the Sunflower Oil. This resulted in a 10% improvement in the time taken for sunflower oil to reach the 20% cut point.

CONCLUSION

The Oxidative Stability Study shows that Oat Lipid e is not only an inherently stable oil but that it also confers stability to less stable fats and oils. It is likely that the antioxidants including caffeic and ferulic acid, tocotrienols and tocopherols contained within the Oat Lipid e have a significant effect on the inherent stability of Oat Lipid e, making it far more stable than its unsaturated lipid profile would indicate. These antioxidants are able to be donated to act as stabilisers for other oils in a shared system.

It has been claimed that oat oil inhibits skin lipid peroxidation in response to ultraviolet irradiation of the skin (Lapsed patent US5620692A). Skin lipid peroxidation can lead to skin ageing and inflammatory responses. This study indicates that this claimed inhibition may actually be due to the same mechanism described above.

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