



**Issued to:** Water and Food Analysis Laboratory TTD **Lab Ref. No.:** AB023654  
 Marketing Godown, **Booking ID :** BID-011161  
 Tirumala, Andhra Pradesh **Report number :** NCL-026172  
 Tirupati-517504 **Report issue date :** 23-07-2024  
 Email: sreenivasa981@gmail.com **ULR No. :** TC1151624000010521F  
 Kind Attention: Shri Shreenivasa Swamy **Customer Request ref.:**

Customer Provided Information			
<b>Name of the Sample:</b>	Ghee		
<b>Batch Number:</b>	NA	<b>Customer Sample Code:</b>	TN02BB 2151(4)
<b>Mfg. Date:</b>	NA	<b>Exp. Date:</b>	NA
<b>Other details (if any):</b>	COW GHEE ; Date:12.07.2024		

Laboratory Provided Information			
<b>Sample Receipt Date:</b>	17-07-2024	<b>Analysis Completion Date:</b>	23-07-2024
<b>Sampling Details:</b>	NA		
<b>Other details (if any):</b>	NA		

## TEST RESULTS

### 1 Chemical

1.1 Food & Agricultural products (except Human Milk)							
Sr. No	Parameters	Unit	Results	Specification FSSAI requirement	LOQ	Test Method	
1	Free fatty acid (oleic acid)	%	As Such Basis 0.345	2.000 (Max.)	-	FSSAI 01.089.2022 Manual of Method of Analysis of Food (Dairy and dairy products): 2022	
2	Baudouin test		As Such Basis Negative	Negative	-	FSSAI 01.091.2022 Manual of Method of Analysis of Food (Dairy and dairy products)	
3	Butyro Refractometer reading (at 40 degree celsius)		As Such Basis 41.700	40.000 - 44.000	-	FSSAI 01.088.2022 Manual of Method of Analysis of Food (Dairy and dairy products)	
4	Reichert Meissl (RM) value		As Such Basis 28.350	24.000 (Min.)	-	FSSAI 01.090.2022 Manual of Method of Analysis of Food (Dairy and dairy products)	
5	Polenske value		As Such 1.750	0.500 - 2.000	-	FSSAI 01.090.2022 Manual	



		Basis				of Method of Analysis of Food (Dairy and dairy products)
6	Moisture	%		0.104	0.500 (Max.)	- FSSAI 01.086.2022 Manual of Method of Analysis of Food (Dairy and dairy products)
# 7	Purity of milk fat		As Such Basis	As per attached annexure-I		- ISO 17678 : 2019
8	Milk fat (%)	%	As Such Basis	99.677	99.500 (Min.)	- Clause 4 of IS 3509 : 1966
9	Iodine Value		As Such Basis	35.097	25.000 - 38.000	- FSSAI 02.010.2021 Manual of method of analysis of foods (Oils and Fats)
# 10	Saponification Value		As Such Basis	249.644	205.000 - 235.000	- FSSAI 02.007.2021 Manual of method of analysis of foods (Oils and Fats)
11	Mineral Oil		As Such Basis	Negative	Negative	- FSSAI 02.030.2021 Manual of method of analysis of foods (Oils and Fats)
# 12	β-Sitosterol	mg/kg	As Such Basis	167.895	Absent	10.000 FSSAI file no.1-90/FSSAI/SP(MS&A)
13	Added Colouring Matter		As Such Basis	Negative	Negative	- IS 548 (Part 2): 1876
14	Arachidic acid (C20:0)	%	As Such Basis	0.274	NA	0.050 AOAC 996.06,21st Edition: 2019
15	Arachidonic acid (C20:4n6)	%	As Such Basis	Below limit of quantification	NA	0.050 AOAC 996.06,21st Edition: 2019
16	Behenic acid (C22:0)	%	As Such Basis	Below limit of quantification	NA	0.050 AOAC 996.06,21st Edition: 2019
# 17	Butyric acid (C4:0)	%	As Such Basis	Below limit of quantification	1.000 - 5.000	0.050 AOAC 996.06,21st Edition: 2019
# 18	Capric acid (C10:0)	%	As Such Basis	0.776	0.800 - 5.000	0.050 AOAC 996.06,21st Edition: 2019
# 19	Caproic acid (C6:0)	%	As Such Basis	0.060	0.500 - 2.200	0.050 AOAC 996.06,21st Edition: 2019
20	Caprylic acid (C8:0)	%	As Such Basis	0.848	0.400 - 1.500	0.050 AOAC 996.06,21st Edition: 2019
21	Cis-10-Heptadecenoic acid (C17:1)	%	As Such Basis	Below limit of quantification	NA	0.050 AOAC 996.06,21st Edition: 2019
22	Cis-10-Pentadecenoic acid (C15:1)	%	As Such Basis	Below limit of quantification	NA	0.050 AOAC 996.06,21st Edition: 2019
23	cis-11,14, 17-Eicosatrienoic acid (C20:3n3)	%	As Such Basis	Below limit of quantification	NA	0.050 AOAC 996.06,21st Edition: 2019
24	Cis-11,14-Eicosadienoic	%	As Such Basis	Below limit of quantification	NA	0.050 AOAC 996.06,21st Edition: 2019



acid (C20:2)							
25	Cis-11-Eicosenoic acid (C20:1)	%	As Such Basis	0.064	NA	0.050	AOAC 996.06,21st Edition: 2019
26	Cis-13,16-Docosadienoic acid (C22:2)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
27	cis-4,7,10,13,16,19-Docosahexaenoic acid (C22:6n3)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
28	Cis-5,8,11,14,17-Eicosapentaenoic acid (C20:5n3)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
29	Cis-8, 11,14-Eicosatrienoic acid (C20:3n6)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
30	Elaidic acid (C18:1n9t)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
31	Erucic acid (C22:1n9)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
32	Heneicosanoic acid (C21:0)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
33	Heptadecanoic acid(C17:0)	%	As Such Basis	0.092	NA	0.050	AOAC 996.06,21st Edition: 2019
# 34	Lauric acid (C12:0)	%	As Such Basis	10.586	1.500 - 4.000	0.050	AOAC 996.06,21st Edition: 2019
35	Lignoceric acid (C24:0)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
# 36	Linoleic acid (C18:2n6c)	%	As Such Basis	5.823	0.500 - 3.500	0.050	AOAC 996.06,21st Edition: 2019
37	Linolelaidic acid (C18:2n6t)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
# 38	Linolenic acid (C18:3n3)	%	As Such Basis	0.088	0.300 - 1.000	0.050	AOAC 996.06,21st Edition: 2019
# 39	Myristic acid (C14:0)	%	As Such Basis	4.504	6.000 - 13.000	0.050	AOAC 996.06,21st Edition: 2019
40	Myristoleic acid (C14:1)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
41	Nervonic acid (C24:1)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
42	Oleic acid (C18:1n9c)	%	As Such Basis	27.404	19.000 - 32.000	0.050	AOAC 996.06,21st Edition: 2019
# 43	Palmitic acid (C16:0)	%	As Such Basis	39.063	22.000 - 38.000	0.050	AOAC 996.06,21st Edition: 2019
# 44	Palmitoleic acid (C16:1)	%	As Such Basis	0.091	0.900 - 2.800	0.050	AOAC 996.06,21st Edition: 2019



45	Pentadecanoic acid (C15:0)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
46	r-Linolenic acid (C18:3n6)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
47	Stearic acid (C18:0)	%	As Such Basis	10.181	8.000 - 19.000	0.050	AOAC 996.06,21st Edition: 2019
48	Tricosanoic acid (C23:0)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
49	Tridecanoic acid (C13:0)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
50	Undecanoic acid (C11:0)	%	As Such Basis	Below limit of quantification	NA	0.050	AOAC 996.06,21st Edition: 2019
51	Test for Rancidity		As Such Basis	Negative	NA	-	FSSAI 02.043.2021 Manual of method of analysis of foods (Oils and Fats): 2021
52	Melting Point	C°	As Such Basis	42.700	NA	-	CALF/SOP/CHEM/MMP/12

**Analyst Remark**

“Results of different individual or category of fatty acids are calculated based upon peak area of individual fatty acids and combining them respectively. FAME mixture of 37 fatty acids is used for identification.”

**The above sample does not comply to the requirements of FSSAI for the tested parameters. The parameter(s) marked with # are out of specification.**

**Remarks:- LOQ : Limit of Quantification.**

**V.No :**

M

**End of Test Report**
**Authorized Signatory  
(Chemical)**



## **Terms and Conditions**

- 1) This test result/report(s) relates only to the tested samples and the applicable parameters. Endorsement based on such report on the product is neither inferred nor implied.
- 2) The sample description is given as specified by the customer and NDDB CALF Ltd is not responsible for verifying it in all cases. Sample is not drawn by NDDB CALF Ltd (unless specified in the Report) and analysis will be conducted on the "as is" received basis unless specified otherwise.
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  - b) Non-perishable items after one month of reporting.
- 5) The test reports shall not be reproduced wholly or in parts or in any manner whatsoever by anyone and cannot be used as an evidence in any court of law, unless required as per the directions of any court and shall not be used in advertising media/social media/print media/any other media, without prior written permission of the Managing Director/Dy. MD, NDDB CALF Ltd.
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- 11) The customer is liable to pay the testing charges as decided and revised from time to time by NDDB CALF Ltd and customers shall pay all the charges and costs either in advance or at the time of handing over the samples for analysis or before collecting the report, as instructed by the NDDB CALF Ltd. The fee is non-refundable and applicable taxes, surcharges, cess including GST shall be levied on the aforementioned charges and payable by the Customer.
- 12) All disputes are subject to the Anand, Gujarat jurisdiction only.
- 13) This test result/report shall be destroyed/disposed-off after 5 years from the date of issue as per retention policy of NDDB CALF Ltd.
- 14) Customer agrees to be bound by all the terms & conditions mentioned herein above.  
By placing any work order or sending samples for testing, the customer confirms that they accept the applicable NDDB CALF Ltd terms & condition of service.

**Annexure-1**  
**Lab. Ref. No. AB023654**  
**Sample Name : Ghee**

**Table- 1. S-Values for sample**

Equation No.	S-Value	Standard S value limits as per method
1	<b>86.62</b>	98.05 to 101.95
2	<b>106.89</b>	99.42 to 100.58
3	<b>22.43</b>	95.90 to 104.10
4	<b>117.42</b>	97.96 to 102.04
5	<b>19.72</b>	95.68 to 104.32

**Interpretation**

- The S value of all equations for sample coded as **AB023654** are **falling out of the range** as prescribed by method.
- If any S-value falls outside the corresponding limits, consider the sample to contain a foreign fat.

**Table -2. S-value equation for its suspected adulterants as per ISO 17678 : 2019**

Equation No.	Foreign fat
1	Soya bean, Sunflower, Olive, Rapeseed, Linseed, Wheat germ, Maize germ, Cotton seed, Fish oil
2	Coconut and Palm kernel fat
3	Palm oil and Beef tallow
4	Lard
5	Total

**Note**

- Consider the test samples as pure milk fat when all five S-values fall inside the limits mentioned in Table-1.
- However, under the circumstances listed hereafter, a false positive result can be obtained. Hence, the method is not applicable to milk fat in case of:
  - Obtained from bovine milk other than cow's milk, however BIS 16326:2015 mentioned that method given in ISO 17678 may be used for determination of milk fat purity till such a time study for validation and standardisation of GC method as per ISO 17678 for determination of milk fat purity in bovine milk other than cow milk is completed.
  - Obtained from single cow's;
  - Obtained from cows which received an exceptionally high feeding of pure vegetable oils such as rapeseed oil, cotton or palm oil etc.;
  - Obtained from cow suffering from serious underfeeding (strong energy deficit);
  - Obtained from colostrums;
  - Subjected to technological treatments such as removal of cholesterol or fractionation;
  - Obtained from cheeses showing increased lipolysis;
  - Extracted by using the Gerber, Weibull-Berntrop or Schmid-Bondzynski-Ratzlaff methods, or that has been isolated using detergent.