

Supplements

Lipidomic analysis of very long chain fatty acids from yeast

Table 1S. List of breweries and their basic characteristics.

Brewery ^{a,b}	No. of pitchings (yeast generations))	Yearly beer output (hl)	Waste yeast (t dry weight/year)
A	1 x	1.300.000	12.000
B	4 x	65.000	700
C	5 x	150.000	1.600
D	6 x	1.000	10
E	7 x	7.600.000	85.000
F	4 x	3.000.000	42.000
G	1 x	90.000	1.000

^a Bottom fermentation with *S. pastorianus*

^b Brewer's yeast is classified into two species - *Saccharomyces pastorianus* for bottom beer fermentation and *Saccharomyces cerevisiae* for the top-fermented beer. Strains of *S. pastorianus* are adapted to the conditions of fermentation at lower temperatures (8-14 °C) and using the sugar melibiose. Typical for yeast of the species *S. cerevisiae*, which is used for top beer fermentation, is fermentation at higher temperatures (18-24 °C), and, unlike the bottom yeast, it does not use melibiose [1]. Strains of *S. cerevisiae* are also used as distillery yeast. Distillery yeast is characterized by a high tolerance to ethanol (and stress factors in general), high fermentation rate, high yield per unit of substrate consumed and a small amount of side products such as esters, fatty acids, etc. [2].

References not listed in the main text

1. E.J. Lodolo, J.L. Kock, B.C. Axccl, M. Brooks, FEMS Yeast Res 8 (2008) 1018-1036.
2. A. Bekatorou, C. Psarianos, A.A. Koutinas, Food Technol Biotechnol 44 (2006) 407-415.

Table 2S. Fatty acid abbreviation and trivial name.

FA	abbreviation	trivial name
Cy	8:0	Caprylic
C	10:0	Capric
La	12:0	Lauric
M	14:0	Myristic
P	16:0	Palmitic
Po	9-16:1 or 16:1 ω -7	Palmitoleic
S	18:0	Stearic
O	9-18:1 or 18:1 ω -9	Oleic
L	9,12-18:2 or 18:2 ω -6	Linoleic
A	20:0	Arachidic
G	11-20:1 or 20:1 ω -9	Gondoic
B	22:0	Behenic
E	13-22:1 or 22:1 ω -9	Erucic
Lg	24:0	Lignoceric
N	15-24:1 or 24:1 ω -9	Nervonic
Ce	26:0	Cerotic
Xi	17-26:1 or 26:1 ω -9	Ximenic
Mo	28:0	Montanic
Oc	19-28:1 or 28:1 ω -9	-
Me	30:0	Melissic
Lu	21-30:1 or 30:1 ω -9	Lumequeic
Lc	32:0	Lacceroic

Table 3S. Comparison of NHI-D FAME mix analytical standard, ampule of 100 mg (Neat) (Sigma cat. no. O8381-1AMP) with measured values for FID and MS detectors.

FAME	wt.% ^a	FID ^b	±S.D. ^c	MS ^d	±S.D. ^c	±S.D. ^e	±S.D. ^f
14:0	11.80	12.29	±0.09	11.37	±0.12	±0.46	±0.63
16:1	6.90	7.35	±0.11	6.39	±0.08	±0.48	±2.83
16:0	23.60	23.63	±0.08	23.76	±0.09	±0.09	±5.02
18:1	44.60	43.28	±0.12	45.08	±0.13	±0.93	±6.59
18:0	13.10	13.45	±0.10	13.40	±0.11	±0.19	±4.66

^a NHI-D FAME

^b flame ionization detector

^c arithmetic means from three analysis ± standard deviations

^d ion trap – total ion current

^e S.D. computed from % weight of standard mix and detector (FID, MS) responses

^f S.D. of differences between individual breweries, see Table 1.

Table 4aS. Molecular species of PtdEtn containing VLCFAs from 7 breweries and Pangamin.

molecular species	Brewery A	±S.D. ^a	Brewery B	±S.D.	Brewery C	±S.D.	Brewery D	±S.D.	Brewery E	±S.D.	Brewery F	±S.D.	Brewery G	±S.D.	Pangamin	±S.D.	±S.D. ^b
22:1/22:1	0.197	0.002	0.188	0.004	0.027	0.007	0.063	0.004	0.488	0.004	0.062	0.003	0.131	0.004	0.267	0.004	0.079
22:1/22:0	0.559	0.004	0.534	0.005	0.032	0.006	0.176	0.006	1.383	0.006	0.076	0.004	0.375	0.009	0.756	0.006	0.312
22:0/22:0	1.563	0.012	1.492	0.012	0.057	0.007	0.100	0.005	3.864	0.012	0.138	0.004	0.251	0.007	2.113	0.011	0.718
22:1/24:1	0.411	0.005	0.393	0.008	0.078	0.006	0.129	0.006	1.017	0.007	0.190	0.005	0.155	0.008	0.556	0.009	0.089
22:1/24:0	1.020	0.014	0.973	0.007	0.073	0.005	0.322	0.009	2.522	0.005	0.177	0.007	0.680	0.011	1.378	0.008	0.532
22:0/24:1	1.184	0.016	1.130	0.009	0.116	0.007	0.176	0.007	2.929	0.009	0.280	0.005	0.790	0.015	1.601	0.017	0.528
22:0/24:0	2.829	0.023	3.486	0.013	0.121	0.006	0.151	0.006	0.529	0.006	0.291	0.006	0.320	0.007	3.824	0.019	1.402
22:1/26:1	0.724	0.009	0.691	0.008	0.078	0.005	0.227	0.008	1.791	0.005	0.190	0.007	0.481	0.008	0.978	0.008	0.320
24:1/24:1	0.888	0.009	0.848	0.009	0.283	0.007	0.280	0.013	2.197	0.008	0.686	0.012	0.591	0.011	1.201	0.009	0.404
22:1/26:0	1.530	0.011	1.460	0.007	0.100	0.008	0.114	0.007	0.379	0.019	0.024	0.007	0.024	0.007	2.068	0.021	0.617
22:0/26:1	2.023	0.017	2.449	0.015	0.691	0.011	0.745	0.012	5.004	0.012	0.357	0.009	0.340	0.008	2.735	0.010	1.087
24:1/24:0	1.020	0.009	0.973	0.009	0.324	0.009	0.322	0.019	2.522	0.010	0.786	0.011	0.680	0.012	1.378	0.016	0.464
22:0/26:0	5.082	0.025	5.228	0.016	0.583	0.027	0.398	0.026	1.256	0.032	0.055	0.010	0.072	0.010	4.802	0.024	1.795
24:0/24:0	2.286	0.021	1.743	0.013	0.405	0.012	0.327	0.021	0.447	0.008	0.786	0.019	0.966	0.016	3.091	0.022	0.858
22:1/28:1	0.345	0.005	0.330	0.009	0.110	0.015	0.108	0.009	0.854	0.007	0.267	0.007	0.230	0.008	0.467	0.008	0.157
24:1/26:1	1.513	0.017	1.444	0.009	0.483	0.019	0.673	0.012	3.743	0.013	0.571	0.008	0.591	0.009	2.045	0.018	0.684
22:1/28:0	0.493	0.007	0.471	0.007	0.157	0.009	0.155	0.010	1.221	0.007	0.381	0.017	0.330	0.008	0.667	0.009	0.225
22:0/28:1	0.954	0.008	0.911	0.008	0.305	0.011	0.300	0.017	2.359	0.009	0.620	0.018	0.715	0.019	1.289	0.007	0.416
24:1/26:0	3.832	0.021	2.324	0.023	0.346	0.010	0.284	0.022	0.947	0.026	0.083	0.023	0.062	0.013	4.135	0.013	1.243
24:0/26:1	3.635	0.037	2.496	0.014	0.289	0.026	1.143	0.027	0.854	0.008	0.696	0.021	0.866	0.023	3.758	0.018	1.619
22:0/28:0	1.398	0.014	1.335	0.015	0.446	0.017	0.439	0.025	3.458	0.019	1.077	0.029	0.931	0.025	1.890	0.020	0.636
24:0/26:0	9.145	0.045	8.730	0.025	0.519	0.022	0.733	0.028	0.105	0.007	0.125	0.024	0.072	0.020	3.180	0.025	3.075
22:1/30:1	0.181	0.003	0.173	0.008	0.057	0.008	0.057	0.007	0.447	0.010	0.138	0.008	0.120	0.008	0.245	0.007	0.082
24:1/28:1	0.724	0.005	0.691	0.004	0.230	0.009	0.227	0.014	1.791	0.007	0.557	0.009	0.481	0.009	0.978	0.008	0.329
26:1/26:1	2.599	0.016	1.711	0.007	3.616	0.007	8.529	0.019	4.027	0.014	8.746	0.009	8.665	0.021	2.779	0.013	0.799
22:1/30:0	0.197	0.004	0.188	0.009	0.062	0.005	0.063	0.008	0.488	0.008	0.152	0.011	0.131	0.008	0.267	0.009	0.090
22:0/30:1	0.543	0.004	0.518	0.008	0.173	0.008	0.171	0.009	1.342	0.009	0.419	0.014	0.361	0.009	0.734	0.007	0.247
24:1/28:0	1.053	0.009	1.005	0.009	0.335	0.012	0.331	0.017	2.604	0.011	0.810	0.020	0.701	0.016	1.423	0.009	0.479
24:0/28:1	1.743	0.015	1.036	0.015	0.230	0.011	0.382	0.012	0.529	0.008	0.557	0.023	0.811	0.017	1.979	0.011	0.650
26:1/26:0	6.546	0.033	8.714	0.016	11.635	0.024	5.125	0.018	1.620	0.025	1.662	0.031	1.086	0.031	5.869	0.031	2.207
22:0/30:0	0.576	0.004	0.550	0.008	0.184	0.020	0.180	0.009	1.423	0.008	0.443	0.017	0.385	0.024	0.779	0.009	0.262
24:0/28:0	2.516	0.018	6.971	0.025	0.462	0.017	0.575	0.011	6.225	0.018	1.115	0.025	0.866	0.022	4.202	0.014	1.494
26:0/26:0	13.355	0.035	10.457	0.023	2.306	0.018	2.847	0.010	3.304	0.031	0.557	0.018	0.605	0.010	5.602	0.035	6.242
24:1/30:1	0.411	0.008	0.393	0.008	0.132	0.009	0.129	0.006	1.017	0.007	0.319	0.009	0.275	0.009	0.556	0.009	0.187
26:1/28:1	1.234	0.012	1.178	0.009	3.931	0.015	3.882	0.014	3.051	0.005	9.504	0.018	8.226	0.014	1.668	0.015	0.561
22:1/32:0	0.115	0.014	0.110	0.005	0.037	0.007	0.037	0.005	0.284	0.003	0.010	0.007	0.076	0.006	0.016	0.005	0.052
24:1/30:0	0.428	0.009	0.408	0.007	0.137	0.006	0.135	0.007	1.058	0.006	0.329	0.008	0.285	0.009	0.578	0.005	0.195
26:1/28:0	1.793	0.019	1.209	0.010	5.713	0.016	5.643	0.019	4.434	0.010	9.123	0.011	7.566	0.010	3.046	0.010	0.662
24:0/30:1	0.987	0.007	0.942	0.009	0.315	0.009	0.310	0.015	1.017	0.008	0.762	0.010	0.660	0.017	1.334	0.009	0.564
26:0/28:1	3.141	0.021	2.120	0.011	10.012	0.035	9.886	0.046	0.778	0.018	2.420	0.033	2.096	0.033	2.757	0.028	1.749
22:0/32:0	0.345	0.007	0.330	0.007	0.110	0.009	0.108	0.008	0.854	0.007	0.028	0.008	0.230	0.007	0.047	0.007	0.157
24:0/30:0	1.036	0.023	0.989	0.007	0.330	0.008	0.325	0.013	0.733	0.008	0.800	0.018	0.691	0.017	1.401	0.012	0.632
26:0/28:0	4.539	0.034	4.899	0.017	14.467	0.027	14.286	0.003	1.123	0.022	2.712	0.024	1.852	0.026	3.513	0.019	1.689
26:1/30:1	0.707	0.009	0.675	0.007	2.254	0.016	2.225	0.022	1.750	0.020	5.450	0.021	4.714	0.010	0.956	0.009	0.322

28:1/28:1	0.592	0.009	0.565	0.007	1.887	0.009	1.863	0.020	1.464	0.007	4.563	0.022	3.943	0.011	0.800	0.008	0.270
24:1/32:0	0.247	0.005	0.236	0.004	0.078	0.007	0.078	0.008	0.611	0.005	0.021	0.009	0.165	0.008	0.033	0.007	0.112
26:1/30:0	0.740	0.004	0.707	0.009	2.360	0.009	2.336	0.013	1.830	0.008	5.702	0.016	4.934	0.009	1.002	0.008	0.337
26:0/30:1	1.793	0.011	3.266	0.011	5.713	0.023	5.643	0.015	0.443	0.014	1.129	0.019	0.811	0.024	2.424	0.010	0.555
28:1/28:0	0.855	0.010	0.816	0.007	2.725	0.016	2.692	0.014	2.116	0.016	6.589	0.013	5.704	0.027	1.156	0.009	0.389
24:0/32:0	0.625	0.007	0.597	0.006	0.200	0.018	0.196	0.009	1.546	0.008	0.010	0.008	0.416	0.012	0.085	0.009	0.312
26:0/30:0	1.891	0.013	3.329	0.017	6.027	0.015	5.953	0.018	0.261	0.009	0.596	0.009	1.261	0.026	4.736	0.012	1.114
28:0/28:0	1.250	0.018	1.193	0.019	3.983	0.014	3.933	0.017	3.092	0.010	9.632	0.020	8.336	0.022	1.690	0.018	0.569
28:1/30:1	0.329	0.007	0.314	0.009	1.048	0.009	1.035	0.009	0.813	0.007	2.534	0.008	2.192	0.008	0.445	0.008	0.150
28:0/30:1	0.477	0.006	0.455	0.008	1.517	0.008	1.494	0.008	1.180	0.009	3.673	0.009	3.182	0.009	0.645	0.009	0.217
26:1/32:0	0.444	0.009	0.424	0.007	1.415	0.008	1.398	0.009	1.105	0.006	0.076	0.004	2.962	0.009	0.011	0.007	0.269
28:1/30:0	0.345	0.011	0.330	0.009	1.101	0.007	1.086	0.007	0.854	0.008	2.659	0.007	2.302	0.006	0.467	0.009	0.157
26:0/32:0	1.138	0.024	1.082	0.010	3.616	0.014	3.573	0.009	0.280	0.019	0.010	0.006	0.756	0.010	0.153	0.009	0.601
28:0/30:0	0.510	0.009	0.487	0.009	1.625	0.008	1.604	0.007	1.262	0.007	3.930	0.011	3.398	0.007	0.690	0.005	0.232
30:1/30:1	0.181	0.003	0.173	0.007	0.579	0.007	0.569	0.006	0.447	0.005	1.395	0.006	1.206	0.008	0.245	0.007	0.082
28:1/32:0	0.164	0.005	0.201	0.006	0.545	0.006	0.708	0.007	0.418	0.006	0.052	0.005	1.158	0.004	0.012	0.005	0.091
30:1/30:0	0.161	0.003	0.153	0.008	0.667	0.005	0.604	0.008	0.488	0.004	1.309	0.003	1.316	0.005	0.246	0.003	0.095
30:0/30:0	0.197	0.005	0.188	0.004	0.629	0.004	0.559	0.004	0.533	0.007	1.461	0.008	1.268	0.003	0.232	0.004	0.086
28:0/32:0	0.296	0.013	0.283	0.007	0.943	0.009	0.931	0.005	0.733	0.005	0.052	0.009	1.976	0.009	0.009	0.005	0.176
30:1/32:0	0.186	0.004	0.132	0.006	0.330	0.004	0.380	0.007	0.315	0.008	0.031	0.003	0.907	0.003	0.005	0.003	0.066
30:0/32:0	0.113	0.006	0.110	0.005	0.454	0.007	0.337	0.008	0.280	0.004	0.031	0.005	0.842	0.003	0.004	0.002	0.075
32:0/32:0	0.066	0.004	0.063	0.003	0.207	0.003	0.210	0.006	0.161	0.003	0.014	0.002	0.429	0.006	0.002	0.002	0.037

^a Arithmetic means from three analysis $\pm$ standard deviations (blue numbers).

^b Arithmetic means from 7 breweries and Pangamin $\pm$ standard deviations (red numbers).

Table 4bS. Molecular species of PtdIns containing VLCFAs from 7 breweries and Pangamin.

molecular species	Brewery A	S.D. ^a	Brewery B	S.D.	Brewery C	S.D.	Brewery D	S.D.	Brewery E	S.D.	Brewery F	S.D.	Brewery G	S.D.	Pangamin	S.D.	S.D. ^b
22:1/22:1	0.262	0.006	0.267	0.004	0.070	0.007	0.062	0.005	0.423	0.003	0.062	0.007	0.107	0.006	0.194	0.005	0.130
22:1/22:0	0.334	0.005	0.341	0.005	0.090	0.006	0.080	0.008	0.540	0.004	0.161	0.006	0.137	0.005	0.233	0.004	0.158
22:0/22:0	0.712	0.007	0.726	0.009	0.190	0.009	0.170	0.009	1.151	0.009	0.342	0.012	0.071	0.007	0.542	0.008	0.365
22:1/24:1	0.843	0.006	0.860	0.007	0.225	0.008	0.201	0.016	1.362	0.007	0.223	0.008	0.143	0.008	0.652	0.009	0.439
22:1/24:0	1.338	0.009	1.364	0.012	0.358	0.012	0.320	0.012	2.162	0.012	0.104	0.009	0.543	0.009	1.034	0.011	0.698
22:0/24:1	0.262	0.004	0.267	0.006	0.070	0.006	0.062	0.005	0.423	0.003	0.125	0.005	0.107	0.005	0.183	0.002	0.124
22:0/24:0	3.984	0.005	4.936	0.026	0.176	0.007	0.194	0.007	6.438	0.031	0.312	0.009	0.137	0.006	3.522	0.013	2.557
22:1/26:1	0.989	0.009	1.008	0.010	0.265	0.011	0.237	0.011	1.598	0.011	0.217	0.007	0.403	0.011	0.734	0.009	0.494
24:1/24:1	0.509	0.006	0.519	0.006	0.135	0.010	0.122	0.010	0.823	0.009	0.244	0.008	0.208	0.008	0.358	0.008	0.241
22:1/26:0	0.771	0.007	0.786	0.008	0.207	0.009	0.184	0.009	0.124	0.008	0.036	0.011	0.030	0.009	0.524	0.007	0.315
22:0/26:1	1.410	0.011	1.438	0.009	0.377	0.015	0.337	0.013	2.278	0.017	0.390	0.010	0.277	0.007	1.080	0.014	0.727
24:1/24:0	0.771	0.008	0.786	0.007	0.207	0.018	0.184	0.014	1.246	0.009	0.369	0.016	0.312	0.009	0.541	0.008	0.364
22:0/26:0	7.110	0.025	3.484	0.021	0.097	0.008	0.108	0.008	1.149	0.022	0.018	0.007	0.019	0.011	3.673	0.016	2.588
24:0/24:0	3.417	0.013	6.389	0.034	0.176	0.009	0.219	0.009	5.522	0.028	0.312	0.008	0.184	0.011	4.295	0.025	2.647
22:1/28:1	1.803	0.016	2.209	0.020	0.066	0.008	0.087	0.006	2.914	0.015	0.119	0.005	0.148	0.007	2.080	0.023	1.189
24:1/26:1	1.338	0.014	1.364	0.010	0.358	0.023	0.320	0.019	2.162	0.009	0.440	0.015	0.543	0.016	0.967	0.010	0.651
22:1/28:0	0.320	0.006	0.326	0.005	0.086	0.014	0.076	0.006	0.517	0.005	0.155	0.006	0.132	0.008	0.224	0.004	0.151
22:0/28:1	0.451	0.007	0.460	0.006	0.121	0.007	0.108	0.008	0.729	0.006	0.217	0.009	0.184	0.009	0.316	0.006	0.213
24:1/26:0	0.712	0.005	0.726	0.007	0.190	0.008	0.170	0.007	0.115	0.007	0.036	0.009	0.030	0.010	0.483	0.009	0.290
24:0/26:1	0.276	0.008	0.282	0.004	0.073	0.004	0.065	0.005	0.446	0.004	0.134	0.007	0.112	0.006	0.194	0.006	0.131
22:0/28:0	0.989	0.009	1.008	0.009	0.265	0.017	0.237	0.015	1.598	0.009	0.321	0.010	0.403	0.009	0.715	0.007	0.481
24:0/26:0	10.584	0.019	8.420	0.022	1.085	0.034	1.115	0.033	1.710	0.018	0.146	0.023	0.074	0.013	5.635	0.014	4.081
22:1/30:1	0.785	0.004	0.800	0.007	0.210	0.022	0.187	0.021	1.269	0.007	0.378	0.017	0.321	0.010	0.550	0.009	0.371
24:1/28:1	0.974	0.006	0.993	0.008	0.262	0.020	0.233	0.017	1.574	0.008	0.467	0.018	0.397	0.016	0.682	0.019	0.460
26:1/26:1	3.460	0.008	4.403	0.014	11.241	0.018	12.090	0.031	5.591	0.022	22.021	0.031	12.830	0.023	8.686	0.017	6.020
22:1/30:0	0.538	0.009	0.548	0.006	0.144	0.008	0.129	0.009	0.869	0.007	0.259	0.023	0.219	0.009	0.377	0.008	0.254
22:0/30:1	0.567	0.006	0.578	0.008	0.152	0.009	0.136	0.012	0.916	0.008	0.271	0.009	0.230	0.008	0.397	0.009	0.268
24:1/28:0	2.864	0.015	3.128	0.027	0.766	0.015	0.684	0.015	4.628	0.016	1.372	0.022	1.165	0.031	2.307	0.024	1.376
24:0/28:1	0.552	0.008	0.563	0.007	0.148	0.008	0.133	0.009	0.892	0.008	0.265	0.007	0.225	0.009	0.387	0.009	0.261
26:1/26:0	1.759	0.017	1.794	0.019	4.706	0.017	4.204	0.022	0.284	0.014	0.842	0.011	0.715	0.018	2.254	0.021	1.614
22:0/30:0	1.018	0.010	1.038	0.015	0.273	0.014	0.244	0.028	1.645	0.009	0.488	0.018	0.414	0.014	0.714	0.015	0.481
24:0/28:0	2.646	0.031	2.698	0.024	0.708	0.031	0.633	0.024	4.276	0.013	1.268	0.025	1.077	0.027	1.855	0.026	1.250
26:0/26:0	10.875	0.028	6.997	0.010	16.492	0.028	17.267	0.026	1.758	0.018	2.273	0.033	3.234	0.029	8.547	0.022	6.101
24:1/30:1	0.698	0.008	0.712	0.008	0.187	0.010	0.166	0.009	1.128	0.009	0.333	0.010	0.285	0.009	0.489	0.009	0.330
26:1/28:1	2.603	0.015	2.046	0.017	6.573	0.026	7.469	0.028	4.206	0.014	11.778	0.016	16.437	0.024	6.931	0.018	4.832
22:1/32:0	0.349	0.007	0.356	0.007	0.093	0.007	0.083	0.009	0.564	0.007	0.018	0.008	0.143	0.008	0.272	0.006	0.184
24:1/30:0	0.683	0.005	0.697	0.006	0.183	0.009	0.163	0.010	1.104	0.008	0.327	0.009	0.277	0.009	0.479	0.008	0.323
26:1/28:0	6.223	0.027	7.723	0.018	8.247	0.012	10.874	0.018	10.056	0.034	10.314	0.017	18.506	0.032	5.195	0.018	4.102
24:0/30:1	0.654	0.008	0.667	0.007	0.176	0.008	0.157	0.009	1.059	0.018	0.312	0.009	0.266	0.009	0.458	0.009	0.310
26:0/28:1	1.134	0.009	1.156	0.009	3.034	0.009	2.709	0.015	0.183	0.009	0.545	0.018	0.460	0.008	1.453	0.010	1.040
22:0/32:0	0.538	0.008	0.548	0.006	0.144	0.007	0.129	0.009	0.869	0.006	0.027	0.008	0.219	0.007	0.419	0.008	0.283
24:0/30:0	0.756	0.007	0.771	0.007	0.203	0.013	0.180	0.008	1.222	0.007	0.363	0.009	0.307	0.009	0.530	0.009	0.357
26:0/28:0	4.594	0.006	3.676	0.018	3.034	0.018	3.405	0.019	0.742	0.015	0.545	0.013	0.578	0.015	2.205	0.014	1.576
26:1/30:1	0.567	0.007	0.578	0.007	1.516	0.009	1.355	0.013	0.916	0.009	2.717	0.007	2.305	0.009	1.139	0.008	0.778

28:1/28:1	1.396	0.009	1.423	0.016	3.735	0.011	3.336	0.015	2.256	0.015	6.692	0.014	5.676	0.014	2.806	0.013	1.917
24:1/32:0	1.846	0.016	4.225	0.031	0.494	0.027	0.442	0.025	2.983	0.013	0.077	0.020	0.940	0.018	2.079	0.027	1.434
26:1/30:0	0.756	0.008	0.771	0.024	2.023	0.009	1.806	0.021	1.222	0.009	3.624	0.015	3.075	0.009	1.520	0.009	1.038
26:0/30:1	2.050	0.019	2.728	0.016	5.485	0.020	4.898	0.018	0.331	0.020	1.288	0.019	0.639	0.022	2.681	0.023	1.874
28:1/28:0	0.916	0.009	0.934	0.009	2.451	0.025	2.189	0.017	1.480	0.009	4.389	0.014	3.725	0.010	1.840	0.010	1.257
24:0/32:0	0.698	0.008	0.712	0.008	0.187	0.009	0.166	0.009	1.128	0.007	0.033	0.009	0.285	0.009	0.545	0.009	0.368
26:0/30:0	1.381	0.011	1.408	0.017	3.695	0.023	3.301	0.016	0.223	0.012	0.664	0.027	0.562	0.016	1.769	0.017	1.267
28:0/28:0	2.166	0.010	2.505	0.023	5.796	0.017	5.177	0.025	3.500	0.010	9.409	0.034	5.852	0.014	3.633	0.016	2.352
28:1/30:1	0.538	0.008	0.548	0.007	1.439	0.008	1.285	0.009	0.869	0.007	2.580	0.009	2.187	0.009	1.081	0.009	0.739
28:0/30:1	0.451	0.009	0.460	0.008	1.205	0.009	1.078	0.007	0.730	0.008	2.160	0.008	1.834	0.008	0.905	0.011	0.619
26:1/32:0	0.567	0.006	0.578	0.005	1.516	0.008	1.355	0.008	0.916	0.007	0.271	0.008	2.305	0.009	1.035	0.009	0.651
28:1/30:0	0.465	0.008	0.474	0.008	1.246	0.006	1.111	0.007	0.751	0.006	2.229	0.007	1.891	0.007	0.935	0.007	0.639
26:0/32:0	1.381	0.009	1.404	0.009	3.695	0.010	3.301	0.009	0.223	0.014	0.065	0.023	0.562	0.011	1.994	0.012	1.355
28:0/30:0	0.305	0.005	0.311	0.005	0.813	0.007	0.730	0.006	0.493	0.003	1.461	0.006	1.236	0.007	0.611	0.007	0.418
30:1/30:1	0.393	0.004	0.400	0.006	1.050	0.008	0.940	0.007	0.635	0.005	1.881	0.008	1.595	0.006	0.788	0.005	0.539
28:1/32:0	0.145	0.004	0.148	0.004	0.390	0.009	0.348	0.005	0.234	0.004	0.068	0.009	0.592	0.005	0.267	0.006	0.168
30:1/30:0	0.160	0.003	0.163	0.003	0.428	0.005	0.382	0.006	0.259	0.003	0.768	0.005	0.650	0.004	0.321	0.003	0.220
30:0/30:0	0.116	0.002	0.119	0.004	0.311	0.004	0.277	0.004	0.187	0.003	0.556	0.004	0.474	0.004	0.233	0.004	0.160
28:0/32:0	0.174	0.004	0.178	0.005	0.466	0.005	0.417	0.005	0.281	0.002	0.083	0.003	0.710	0.002	0.319	0.005	0.201
30:1/32:0	0.029	0.005	0.030	0.002	0.079	0.002	0.069	0.003	0.047	0.004	0.015	0.004	0.118	0.004	0.053	0.004	0.033
30:0/32:0	0.016	0.004	0.015	0.003	0.038	0.003	0.035	0.002	0.024	0.003	0.006	0.005	0.060	0.003	0.027	0.002	0.017
32:0/32:0	0.029	0.002	0.030	0.005	0.079	0.005	0.069	0.003	0.047	0.002	0.015	0.004	0.118	0.003	0.053	0.003	0.033

^a Arithmetic means from three analysis $\pm$ standard deviations (blue numbers).

^b Arithmetic means from 7 breweries and Pangamin $\pm$ standard deviations (red numbers).

Fig. 1S. GC-MS of FAMES from lipid extract of yeast of brewery A.

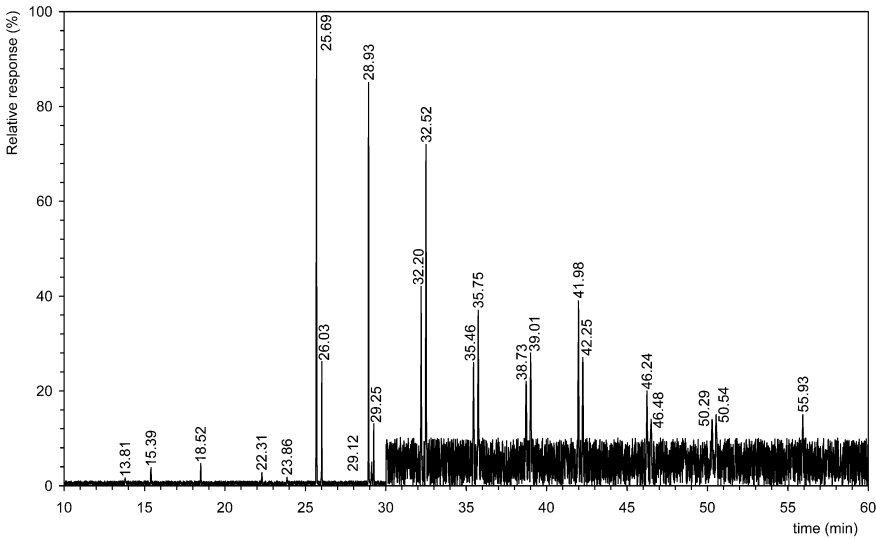


Fig. 2S. DMDS adduct of natural methyl ester of oleic acid.

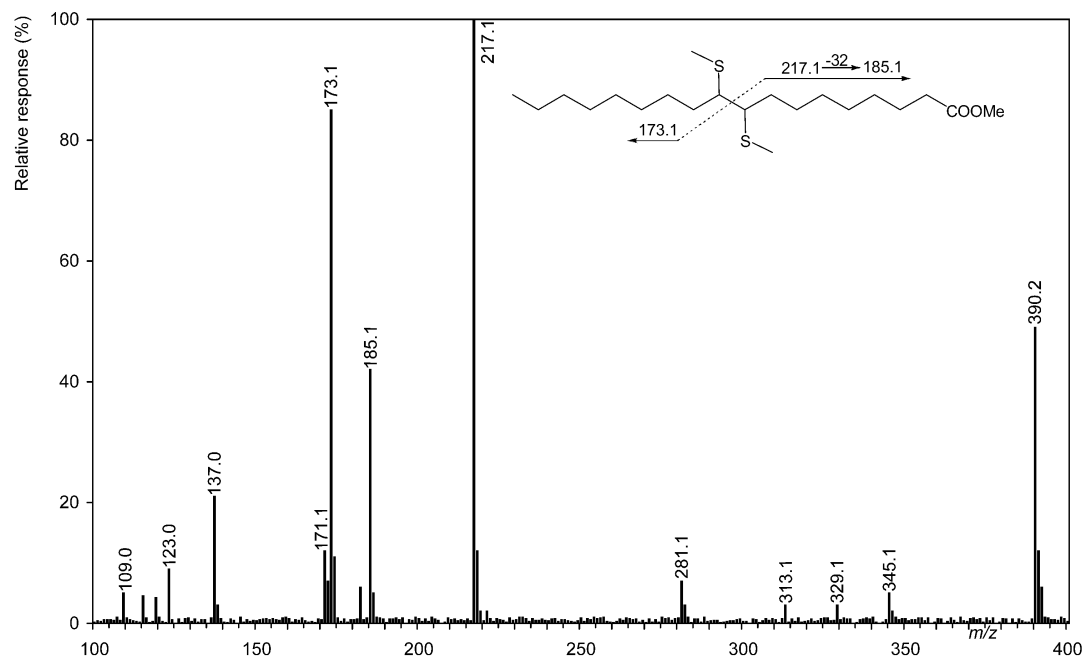


Fig. 3S. DMDS adducts of natural methyl ester of *cis*-vaccenic acid.

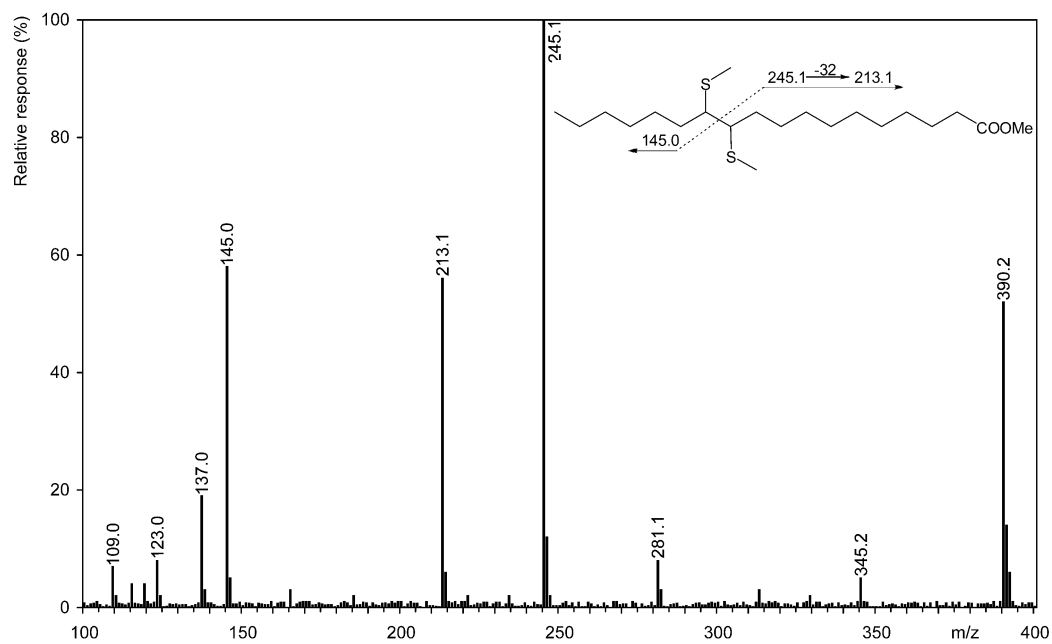


Fig. 4S. The selected-ion monitoring chromatogram for ions at m/z 145 (top trace) for ω -7 FAs, at m/z 173 (middle trace) for ω -9 FAs, and at m/z 117 (lower recording, i.e. blank), i.e. ω -5 FA

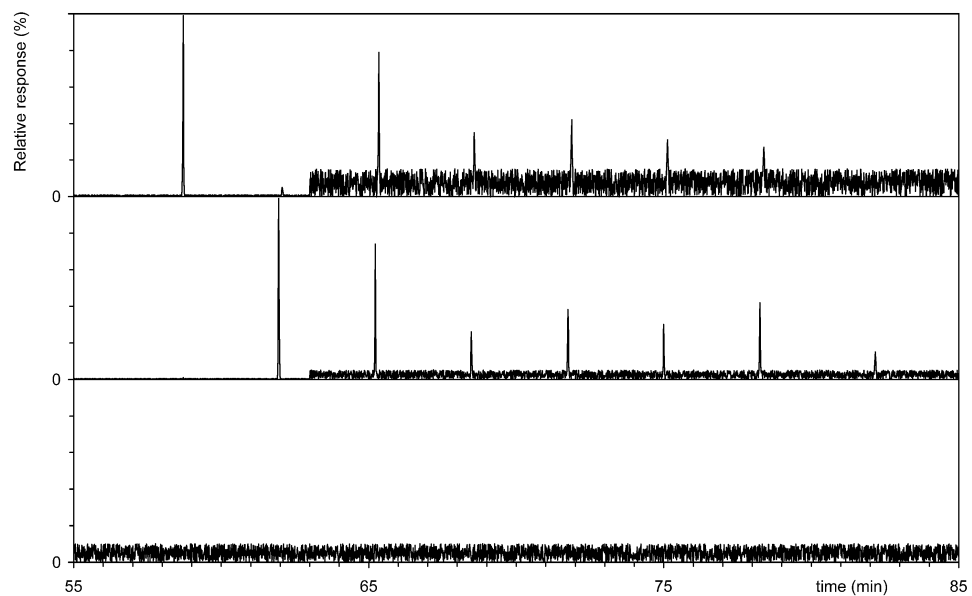


Fig. 5S. 3-Pyridyl carbinol ester of 21-octacosenoic acid (28:1 ω -7).

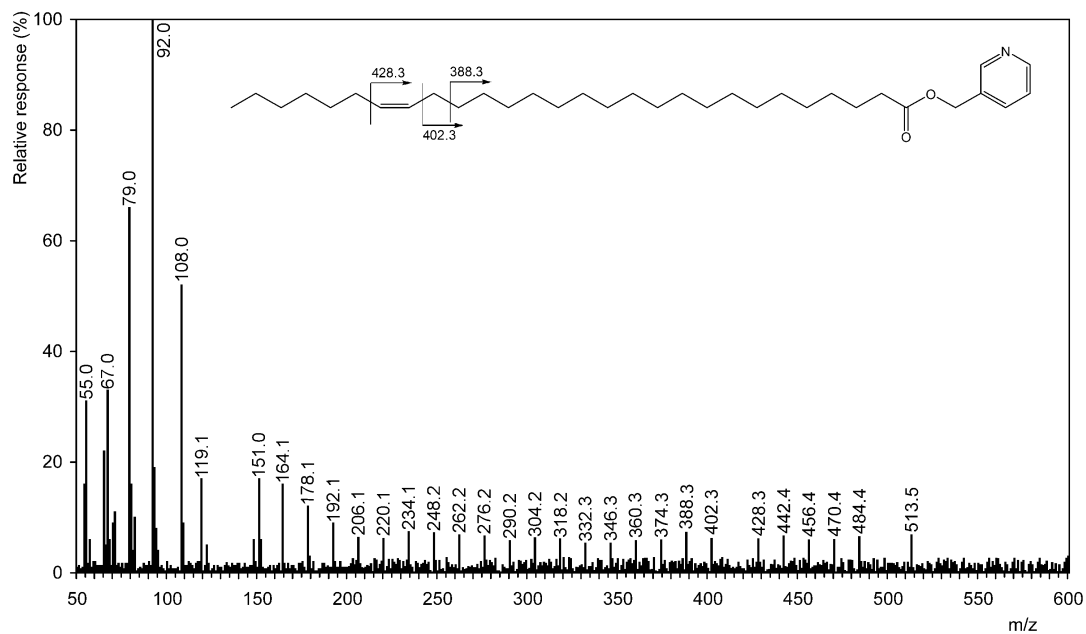


Fig. 6S. 3-Pyridyl carbinol ester of 19-octacosenoic acid (28:1 ω -9).

