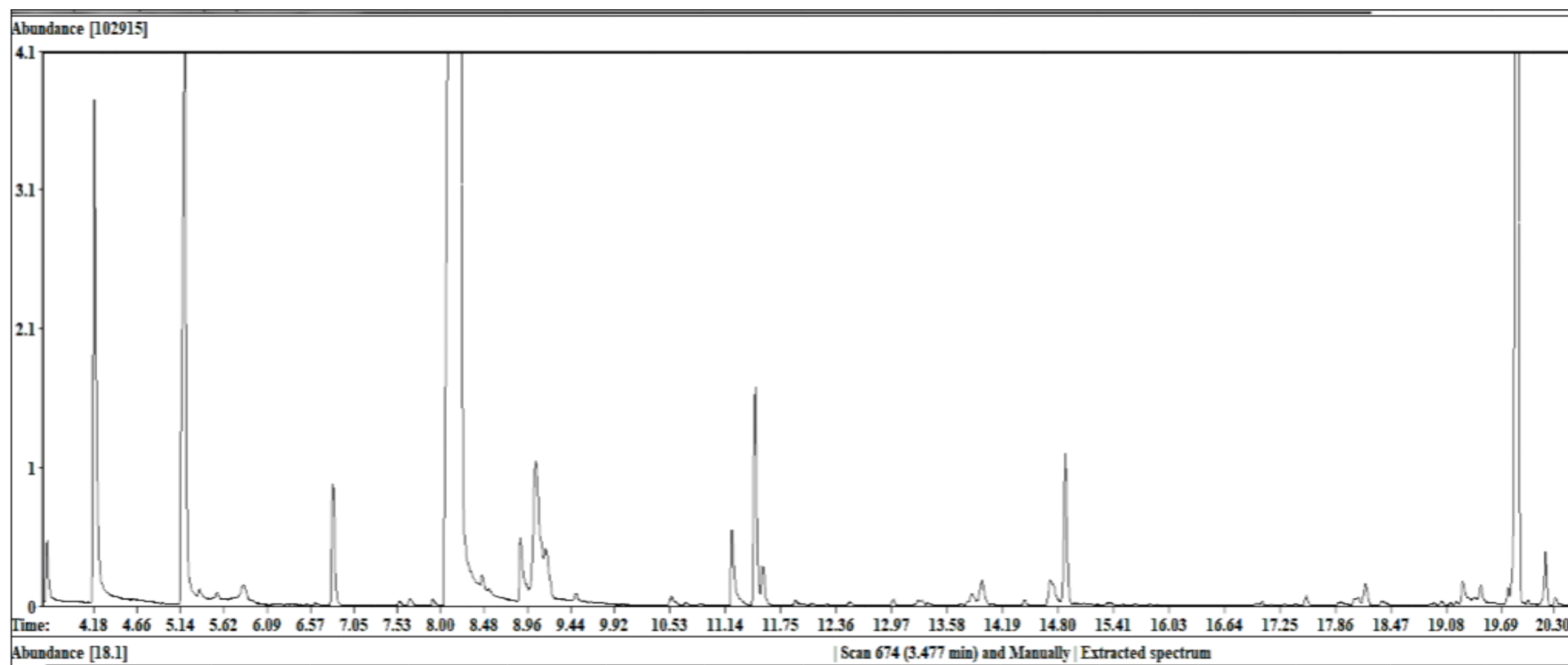
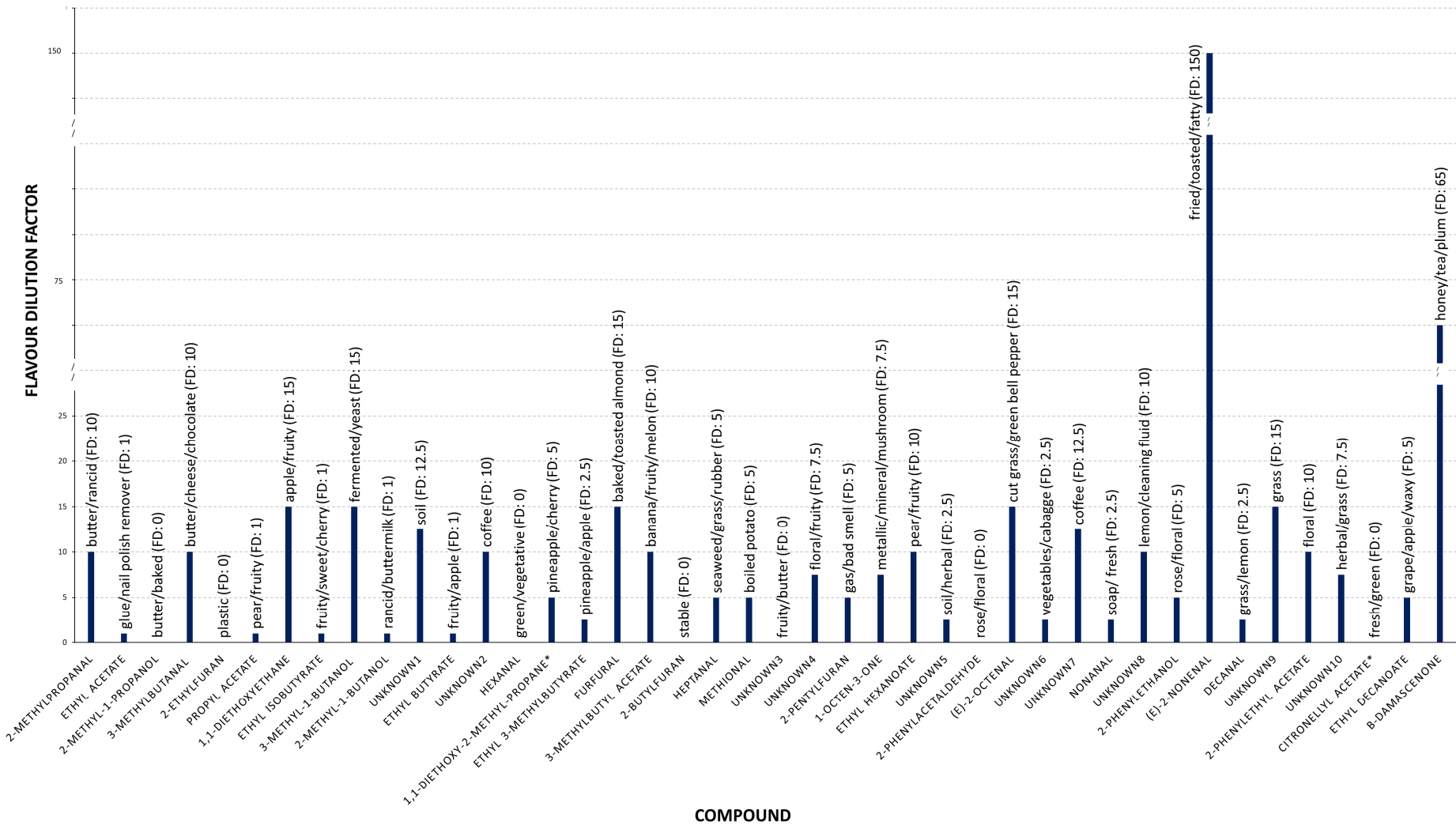




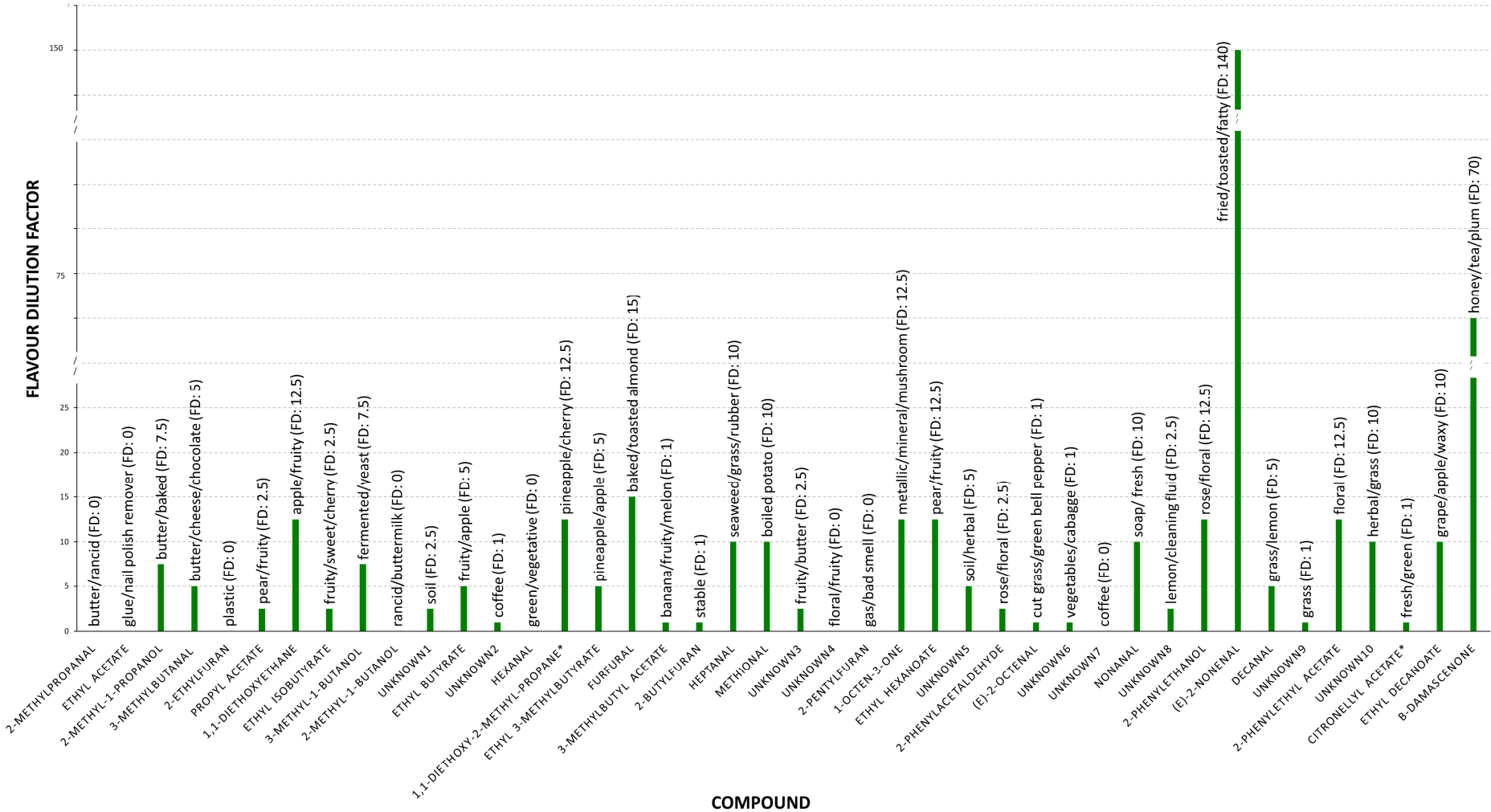
Supplementary Figure 1: Chromatogram of new make spirit sample analysed by GCO.

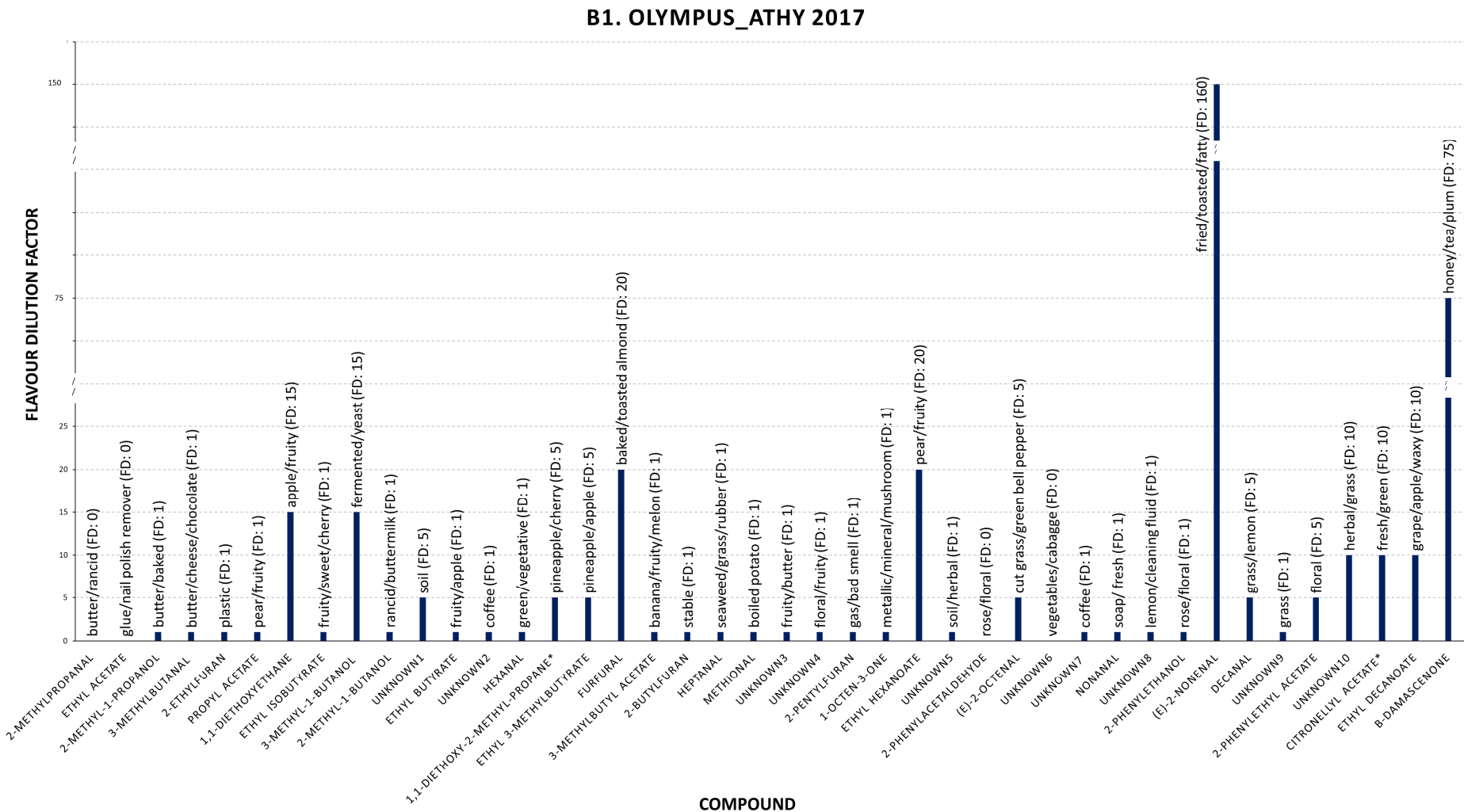
Supplementary Figure 2. Aromagrams of flavor dilution (FD) factors for new make spirits from (A1) Laureate variety/Athy in 2017, (A2) Laureate variety/Athy in 2018, (B1) Olympus variety/Athy in 2017, (B2) Olympus variety/Athy in 2018, (C1) Laureate variety/Bunclody in 2017, (C2) Laureate variety/Bunclody in 2018, (D1) Olympus variety/Bunclody in 2017, (D2) Olympus variety/Bunclody in 2018.

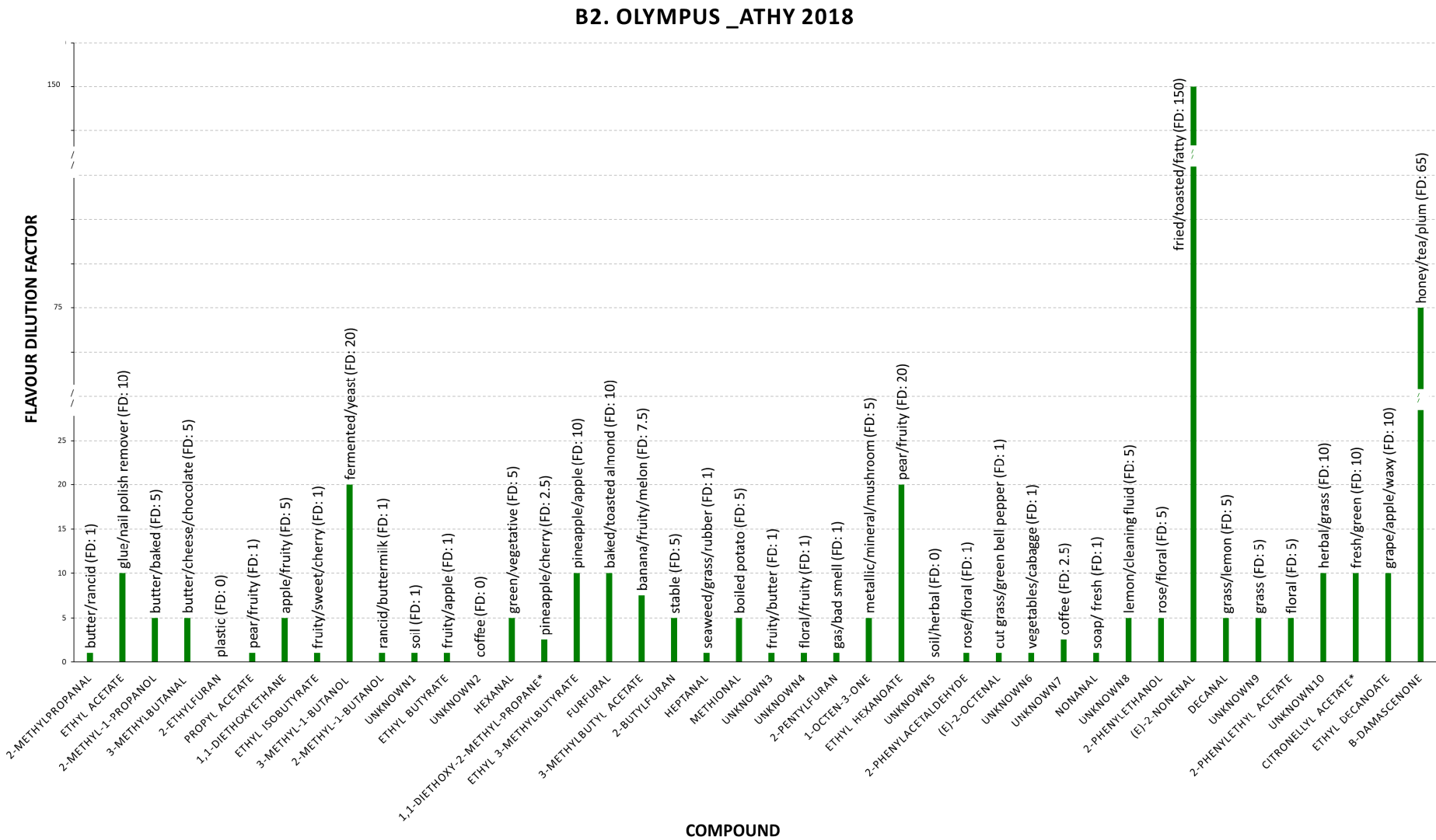
A1. LAUREATE_ATHY 2017



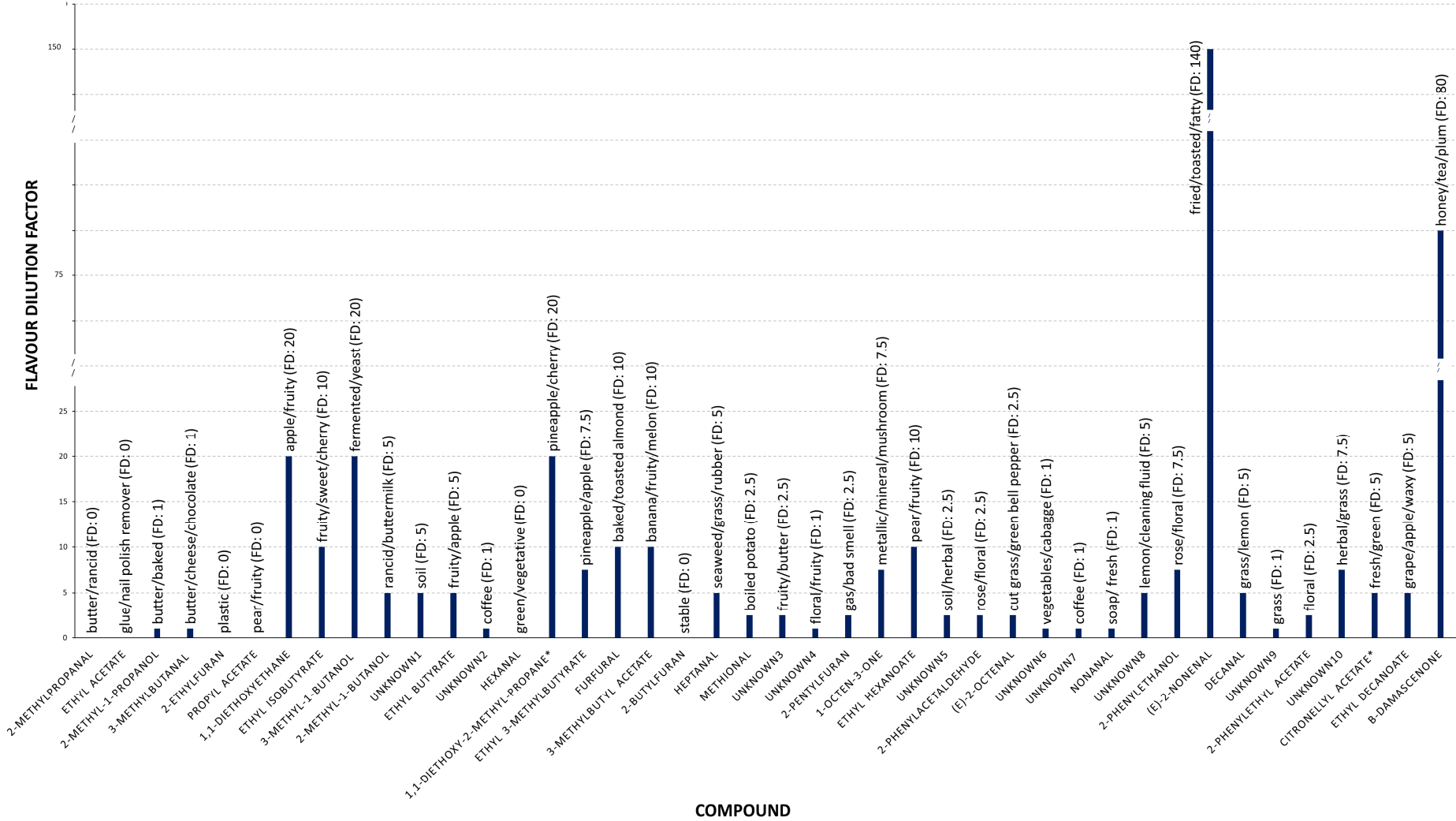
A2. LAURATE_ATHY 2018

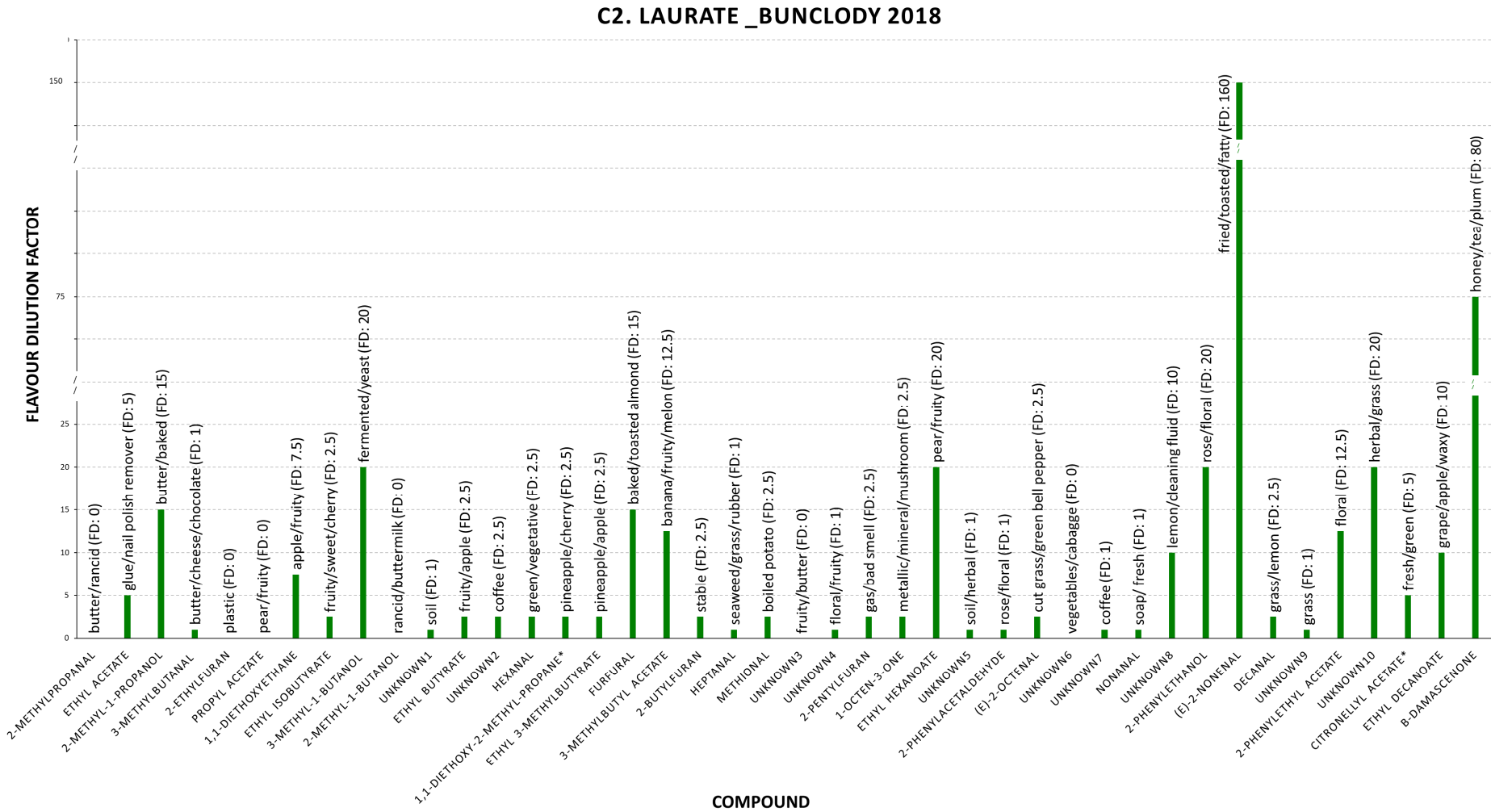




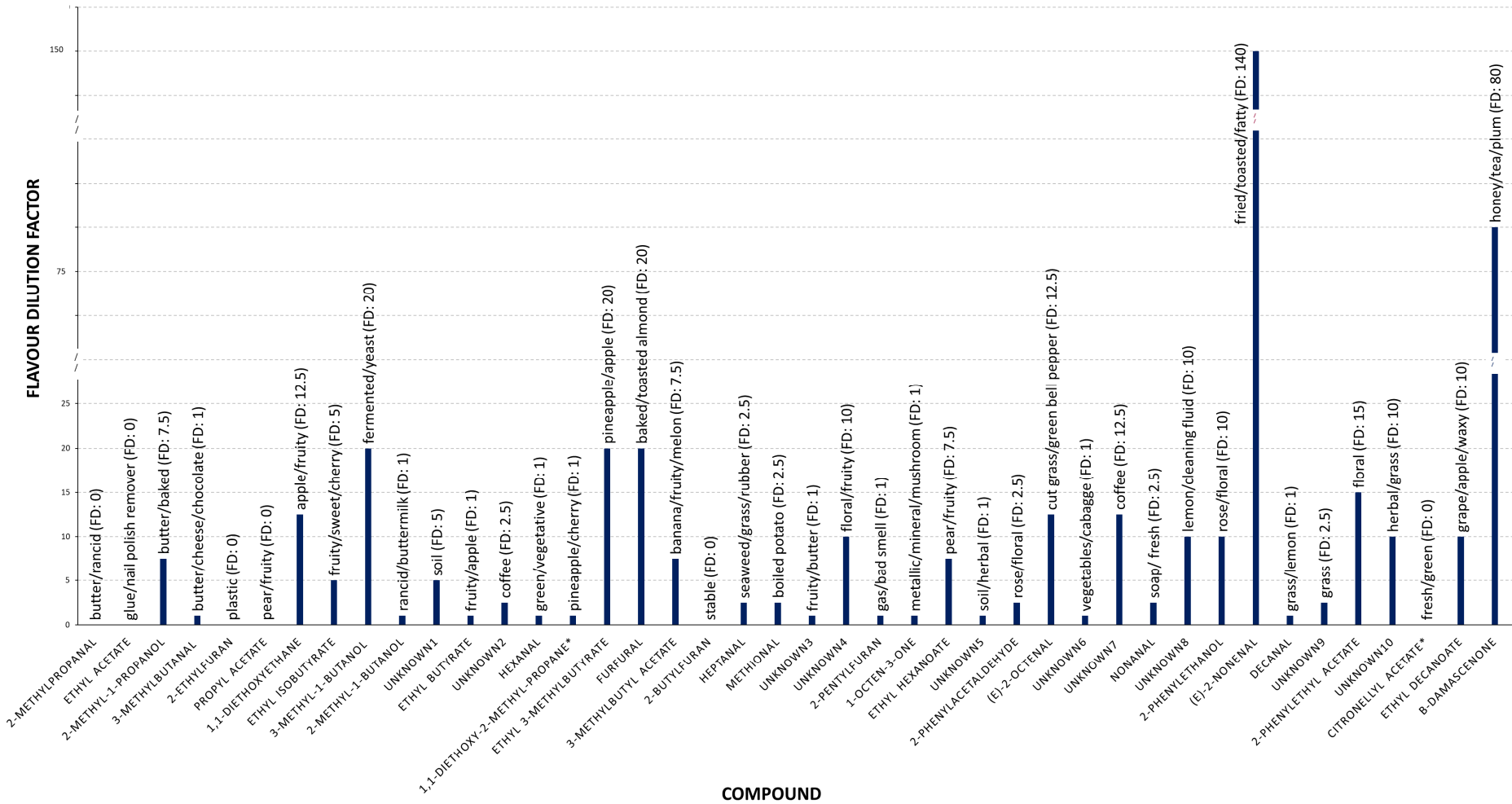


C1. LAURATE_BUNCLODY 2017

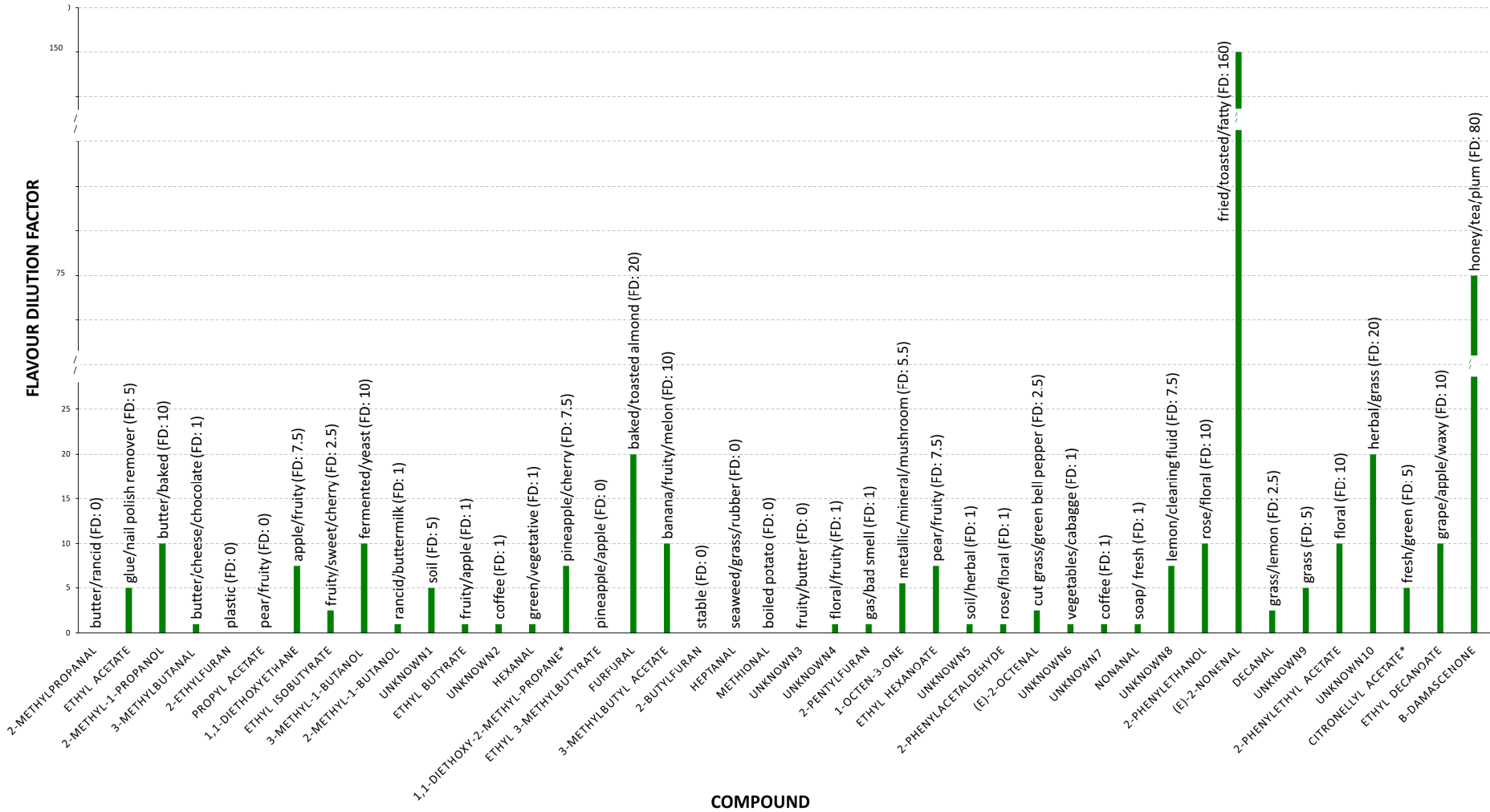




D1. OLYMPUS_BUNCLODY 2017



D2. OLYMPUS_BUNCLOUDY 2018



Supplementary Table 1. Average soil nutrients¹ from Athy, Co. Kildare and Bunclody, Co. Wexford across 2017 and 2018 seasons.

Site	pH	OM	Ca	P	K	Mg	Na	Mn	B	Cu	Zn	Mo
Athy	7.8	7.5	1221	8.2	168	46.9	24.2	0.51	1.11	258	743	35
Bunclody	6.6	7.7	369	5.9	157	16.1	25.6	0.46	1.26	238	451	18

¹ All nutrient values are reported in mg/L, except Cu, Zn, and Mo which are reported in µg/L
Results expressed at 95% confidence interval
OM: Organic matter

Supplementary Table 2. Average weather measurements from Athy, Co. Kildare and Bunclody, Co. Wexford across 2017 and 2018 seasons.

Location	Season	Month	Temperature (°C)	Rainfall (mm)	Humidity (%)	Wind Speed (mph)	Wind Chill (°C)	Dew Point (°C)	Barometer (inHg)	Heat Index (°C)	THW Index (°C)	Heating Degree Days	Cooling Degree Days
Athy	2017	April	15.7	38.1	73.4	2.7	15.6	8.4	29.8	15.4	15.4	42.4	6.7
		May	15.1	18.1	82.6	2.4	15.1	10.8	30.1	15.1	15.1	47.7	3.9
		June	10.0	15.1	80.1	3.6	9.5	6.4	30.0	9.8	9.3	112.6	0.1
		July	14.8	7.3	76.8	3.0	14.6	9.6	30.2	14.7	14.6	54.6	6.9
	2018	August	16.5	30.4	78.4	2.9	16.4	12.3	30.0	16.5	16.4	35.4	10.6
		April	11.5	27.9	79.9	7.9	10.0	8.0	29.8	11.4	9.8	80.3	1.5
		May	10.8	5.1	79.2	5.5	9.8	7.1	30.0	10.6	9.6	60.7	0.1
		June	12.5	12.7	84.0	4.9	11.9	9.7	29.8	12.5	11.8	44.0	2.6
Bunclody	2017	July	16.0	10.2	83.6	4.5	15.8	13.1	29.9	16.2	15.9	23.0	7.1
		August	15.4	12.7	85.6	5.9	14.9	12.9	29.8	15.5	15.0	22.9	3.8
		April	9.4	51.9	84.6	6.0	8.1	6.8	29.9	9.3	8.0	182.4	0.0
		May	13.4	8.6	79.0	3.3	13.2	9.7	30.2	13.3	13.1	102.3	2.8
		June	15.9	20.4	80.5	3.1	15.8	12.4	30.1	15.9	15.8	160.2	11.3
		July	15.8	97.0	77.9	5.0	15.5	11.7	29.9	15.8	15.4	64.2	13.2

2018	August	14.9	144.0	82.4	4.8	14.6	11.8	30.0	14.9	14.6	109.5	4.3
	April	11.1	45.7	85.1	5.6	10.1	8.5	29.9	11.1	10.1	98.4	0.8
	May	11.1	10.2	82.1	5.6	10.1	8.0	30.0	11.0	10.0	68.3	0.6
	June	12.9	12.7	85.3	4.9	12.3	10.4	29.9	13.0	12.3	48.9	3.2
	July	16.4	27.9	84.8	4.8	16.1	13.6	30.0	16.6	16.3	24.8	8.9
	August	15.7	20.3	86.3	5.9	15.2	13.4	29.8	15.9	15.4	39.8	5.0

Supplementary Table 3: Odour description of the pens from the Sniffin' Sticks (Test Blue Kit).

Stick Number		Odour			Correct answer
1	Orange	Banana	Fish	Coffee	Orange
2	Honey	Strawberry	Leather	Bread	Leather
3	Thyme	Fish	Cinnamon	Banana	Cinnamon
4	Mustard	Peppermint	Sweat	Bread	Peppermint
5	Cheese	Soap	Banana	Rose	Banana
6	Vinegar	Banana	Fish	Mustard	Banana
7	Liquorice	Vanilla	Cheese	Apple	Liquorice
8	Smoke	French Fries	Paint Thinner	Onion	Paint Thinner
9	Garbage	Smoke	Garlic	Cheese	Garlic
10	Coffee	Apple	Petrol	Grass	Coffee
11	Garlic	Chocolate	Apple	Orange	Apple
12	Onion	Cloves	Meat	Vinegar	Cloves
13	Tomato	Shrimps	Pineapple	Smoke	Pineapple
14	Mint	Rose	Apple	Mushrooms	Rose
15	Onion	Coffee	Anise	Meat	Anise
16	Tobacco	Strawberry	Basil	Fish	Fish

Supplementary Table 4: Odours detected in new-make spirits and used for the GCO analysis

RT	Attribute	Odour Intensity	RT	Attribute	Odour Intensity
3.20	butter/rancid		13.80	fruity/butter	
4.30	glue/nail polish remover		13.96	floral/fruity	
5.15	butter/baked		14.36	gas/bad smell	
5.33	butter/cheese/chocolate		14.70	metallic/mineral/mushroom	
5.94	plastic		14.89	pear/fruity	
6.71	pear/fruity		16.27	soil/herbal	
6.81	apple/fruity		17.16	rose/floral	
7.90	fruity/sweet/cherry		17.28	cut grass/green bell pepper	
8.08	fermented/yeast		17.35	vegetables/cabagge	
8.15	rancid/buttermilk		17.73	coffee	
8.25	soil		18.07	soap/ fresh	
9.16	fruity/apple		19.22	lemon/cleaning fluid	
9.22	coffee		19.30	rose/floral	
9.50	green/vegetative		19.80	fried/toasted/fatty	
10.55	pineapple/cherry		20.20	grass/lemon	
10.70	pineapple/apple		20.89	grass	
11.20	baked/toasted almond		21.30	floral	
11.50	banana/fruity/melon		21.41	herbal/grass	
12.20	stable		22.26	fresh/green	
12.50	seaweed/grass/rubber		22.70	grape/apple/waxy	
13.31	boiled potato		23.03	honey/tea/plum	

Supplementary Table 5: Standard mix solution in 20% of ethanol in water

Compound	Cas Number	Concentration (mg/L)
2-Ethylfuran	3208-16-0	1
1-Octen-3-one	4312-99-6	0.6
2-Pentylfuran	3777-69-3	1
(E)-2-Nonenal	18829-56-6	0.05
3-Methyl-1-butanol (Isoamyl alcohol)	123-51-3	200
3-Methylbutanal (Isovaleraldehyde)	590-86-3	4
β-Damascenone	23726-93-4	1.5
2-Phenylethanol	60-12-8	10
2-Phenylethyl acetate	103-45-7	10
Ethyl hexanoate	123-66-0	2
3-Methylbutyl acetate (Isoamyl acetate)	123-92-2	3
Ethyl isobutyrate	97-62-1	10
1,1-Diethoxyethane	105-57-7	100
Ethyl 3-methylbutyrate (Ethyl Isovalerate)	108-64-5	9
Heptanal	111-71-7	3
Ethyl decanoate	110-38-3	10
Methional	3268-49-3	5
(E)-2-Octenal	2548-87-0	3
Hexanal	66-25-1	16