

SAMPLE OIL PROFILES: LOW TO HIGH OLEIC CONTENT

	capric-rich	lauric-rich	myristic-palmitic	high palmitic	balanced	stearic-palmitic-oleic	mixed palmitic-oleic	mixed palmitic-oleic-2	high oleic	high-stability oleic
<i>Oil</i>	<i>RBZ</i>	<i>RBD-1</i>	<i>RBD-2</i>	<i>RBD-3</i>	<i>RBD Y</i>	<i>RBD X</i>	<i>RBD W</i>	<i>RBD-4</i>	<i>RDB-5</i>	<i>RBD-6</i>
C8:0	4.5	0.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C10:0	29.3	16.8	13.2	0.0	2.4	0.0	0.0	0.0	0.0	0.0
C12:0	4.4	47.2	2.8	0.2	0.9	0.0	0.1	0.1	0.0	0.0
C14:0	23.6	11.3	24.8	6.0	15.3	0.7	2.0	1.7	0.5	0.6
C16:0	21.5	5.1	31.6	49.1	35.9	24.0	28.7	25.0	6.9	8.2
C16:1	0.1	0.1	0.1	0.4	0.3	0.2	0.4	1.0	0.7	0.8
C18:0	2.3	0.9	4.8	5.1	3.5	21.4	9.5	3.6	1.4	1.9
C18:1	8.5	12.8	13.9	28.7	29.6	43.5	48.9	59.4	79.5	85.9
C18:2	4.6	4.2	4.8	8.3	10.3	7.8	8.0	7.4	8.9	0.05
C18:3	0.3	0.3	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.0

Figure 1

SOLID FAT CONTENT RANGE: SOLAZYME TAILORED OILS

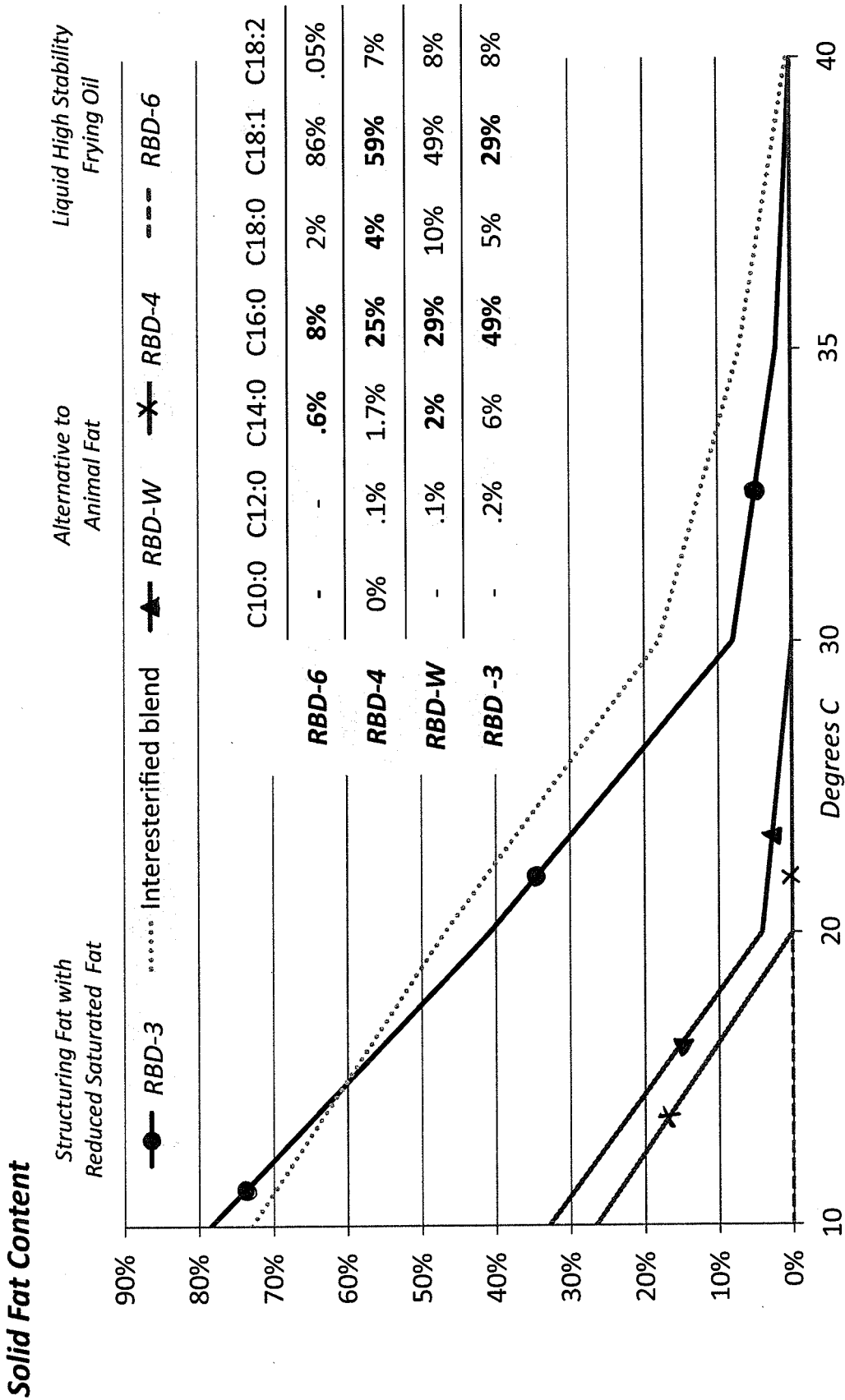


Figure 2

ALTERNATIVE COMPOSITIONS: SIMILAR SFC PROFILES

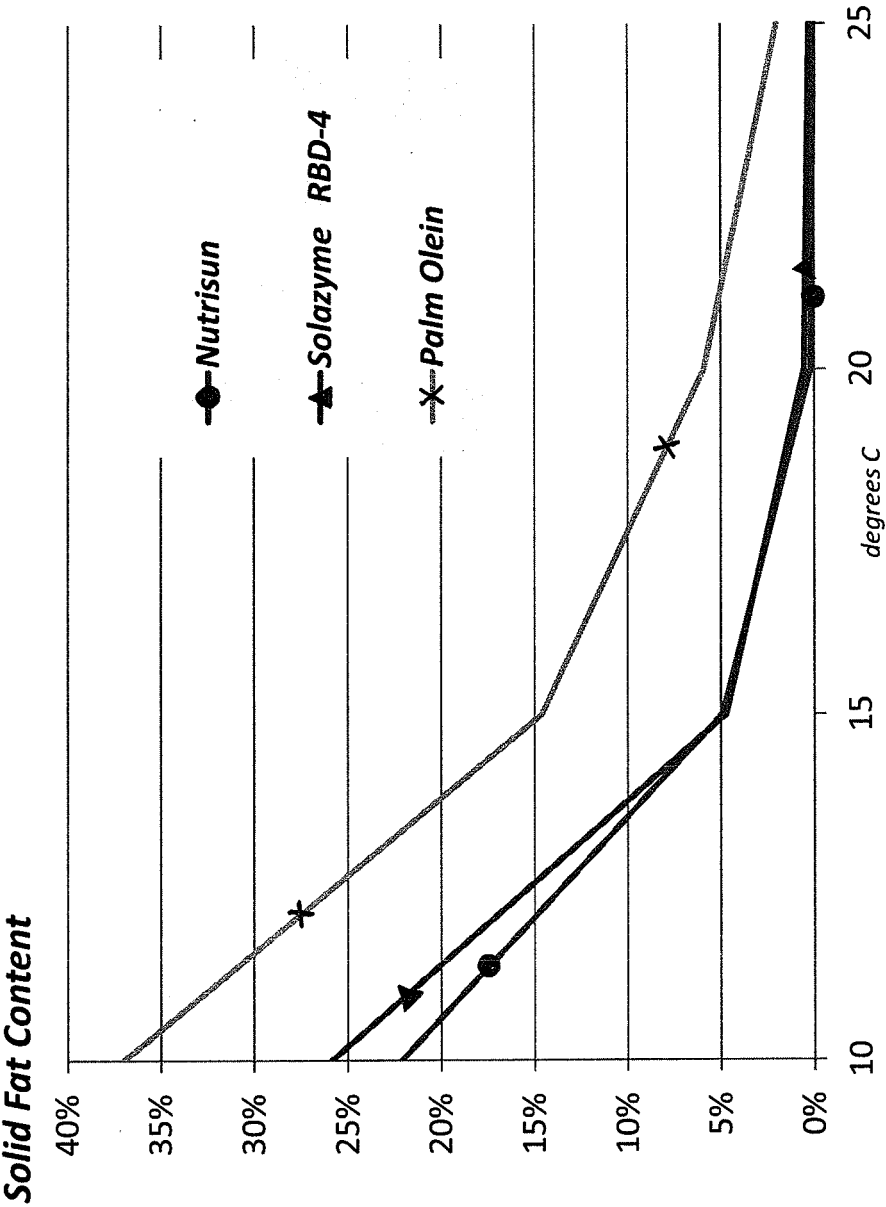


Figure 3

STRUCTURING FAT COMPOSITIONS

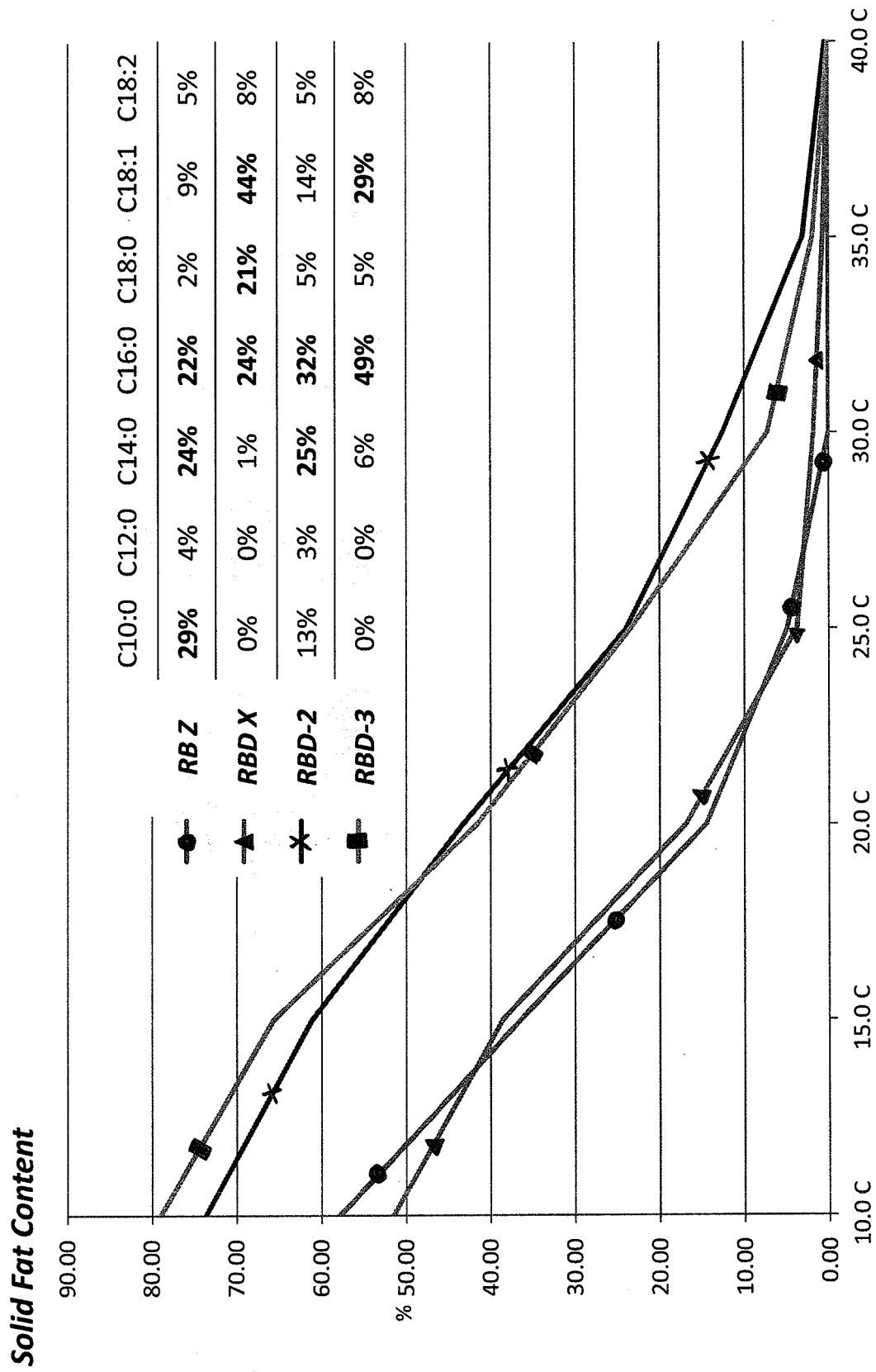


Figure 4

SOLAZYME'S TAILORED OILS: UNIQUE PHYSICAL PROPERTIES

- **Similar fatty acid profile to palm but...**
 - Higher solids & sharper melting
 - Completely melted by body temp
- **~20% lower saturated fat vs. shortening blend**

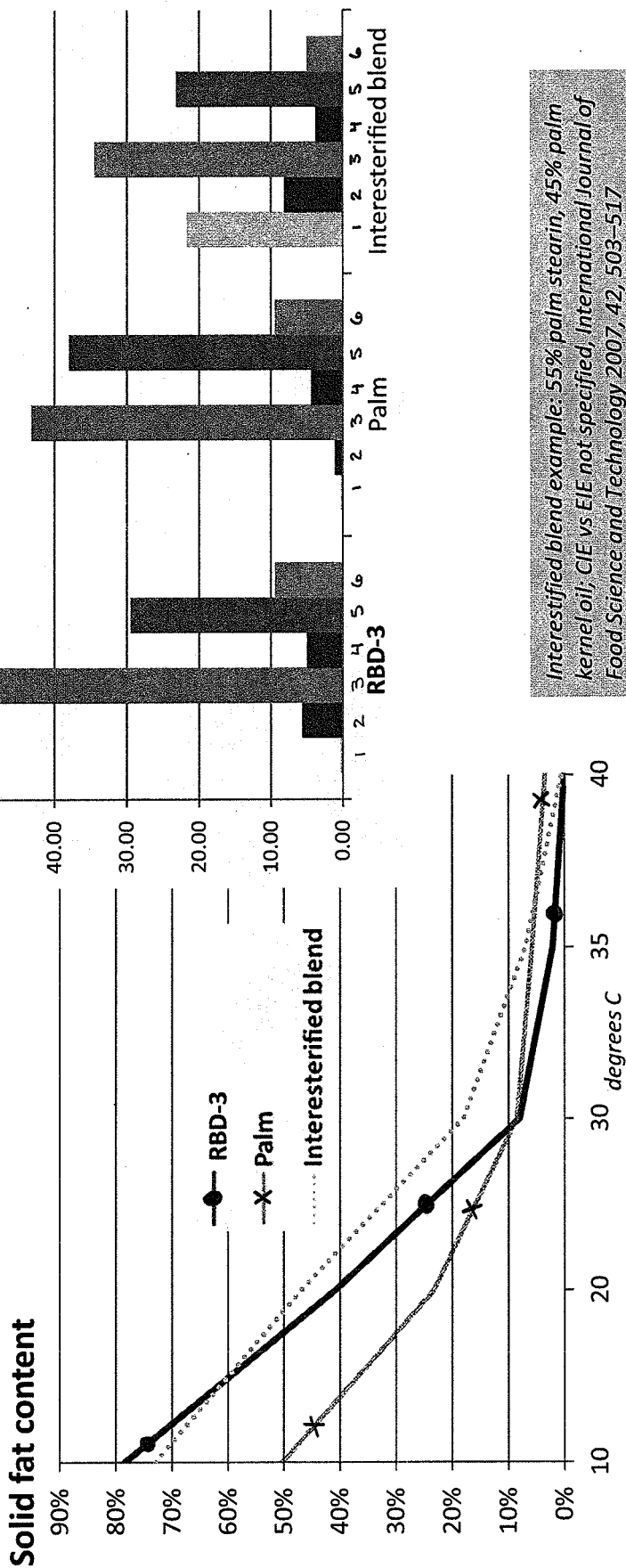


Figure 5

Lauric-Rich Algal Oil

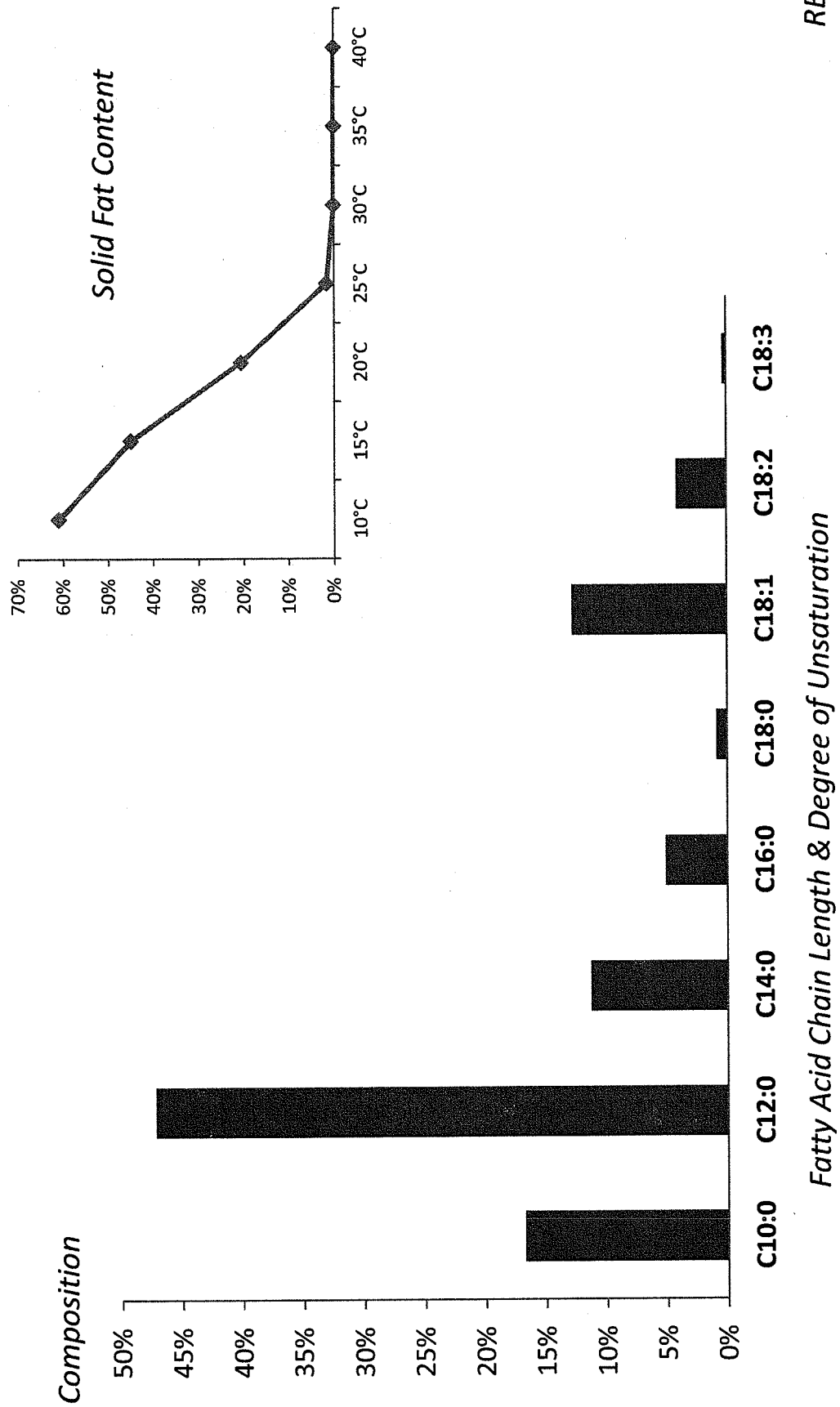


Figure 6

Myristic-Palmitic Algal Oil

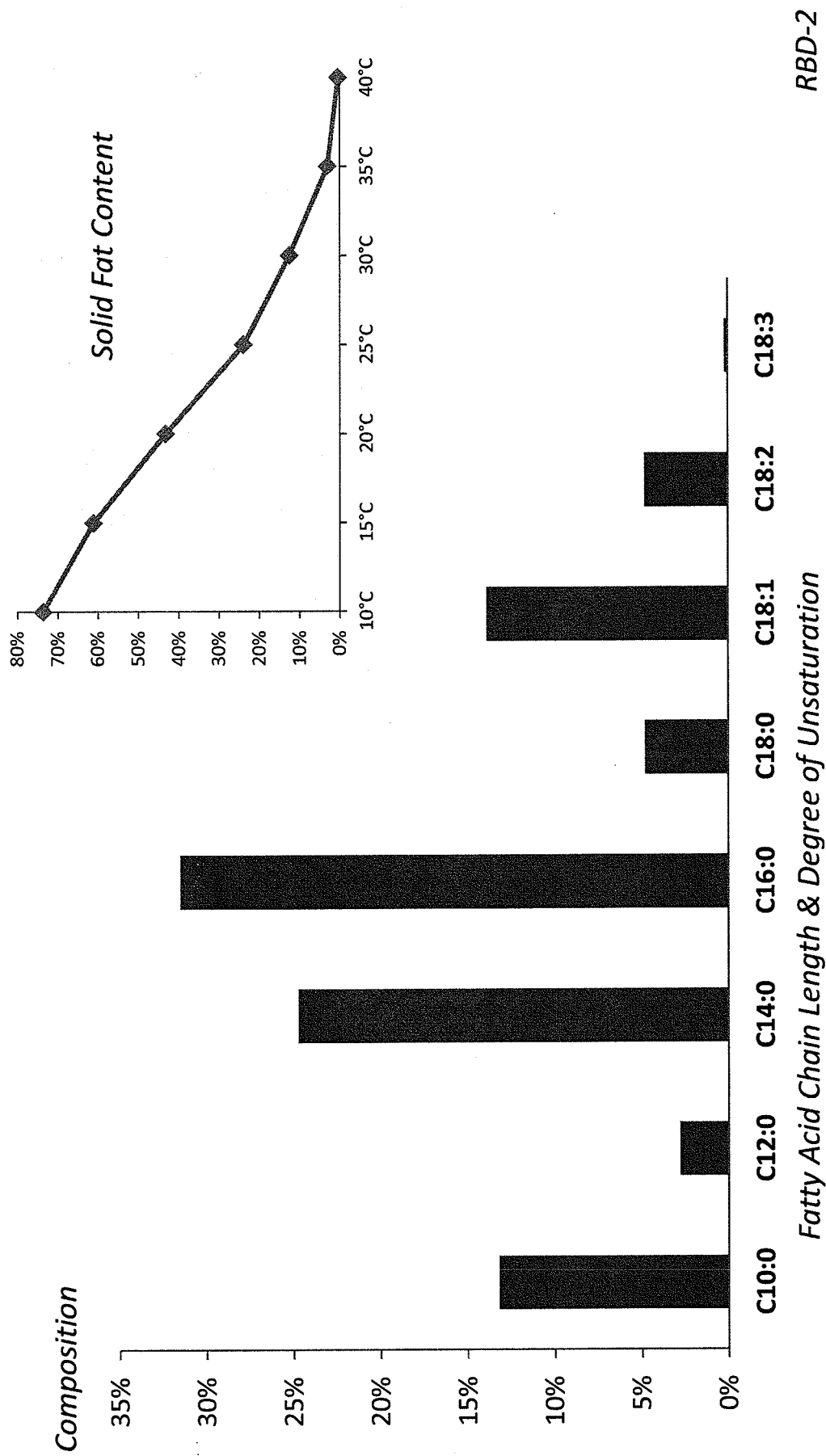


Figure 7

High-Palmitic Algal Oil

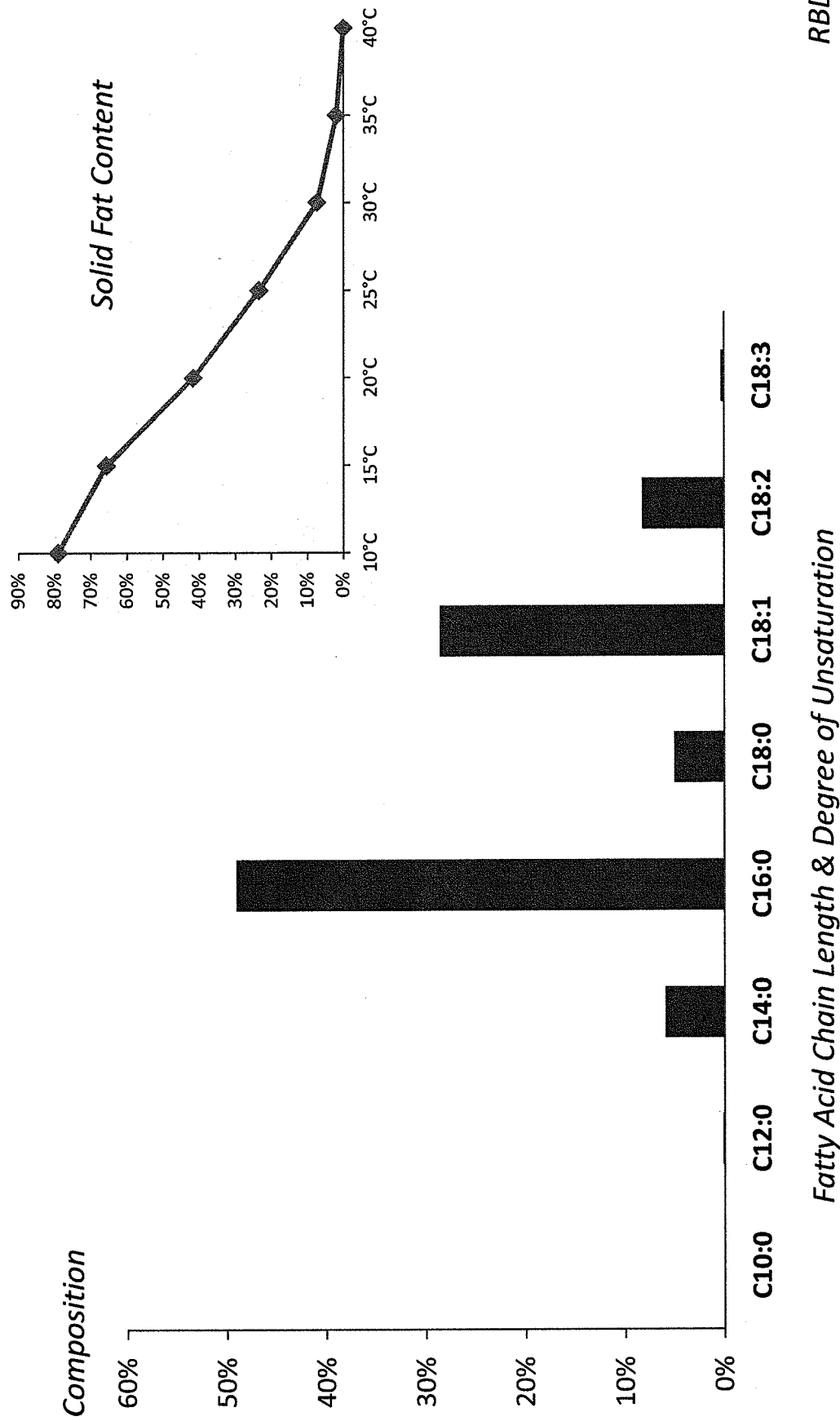


Figure 8

High-Oleic Mid-Palmitic Algal Oil

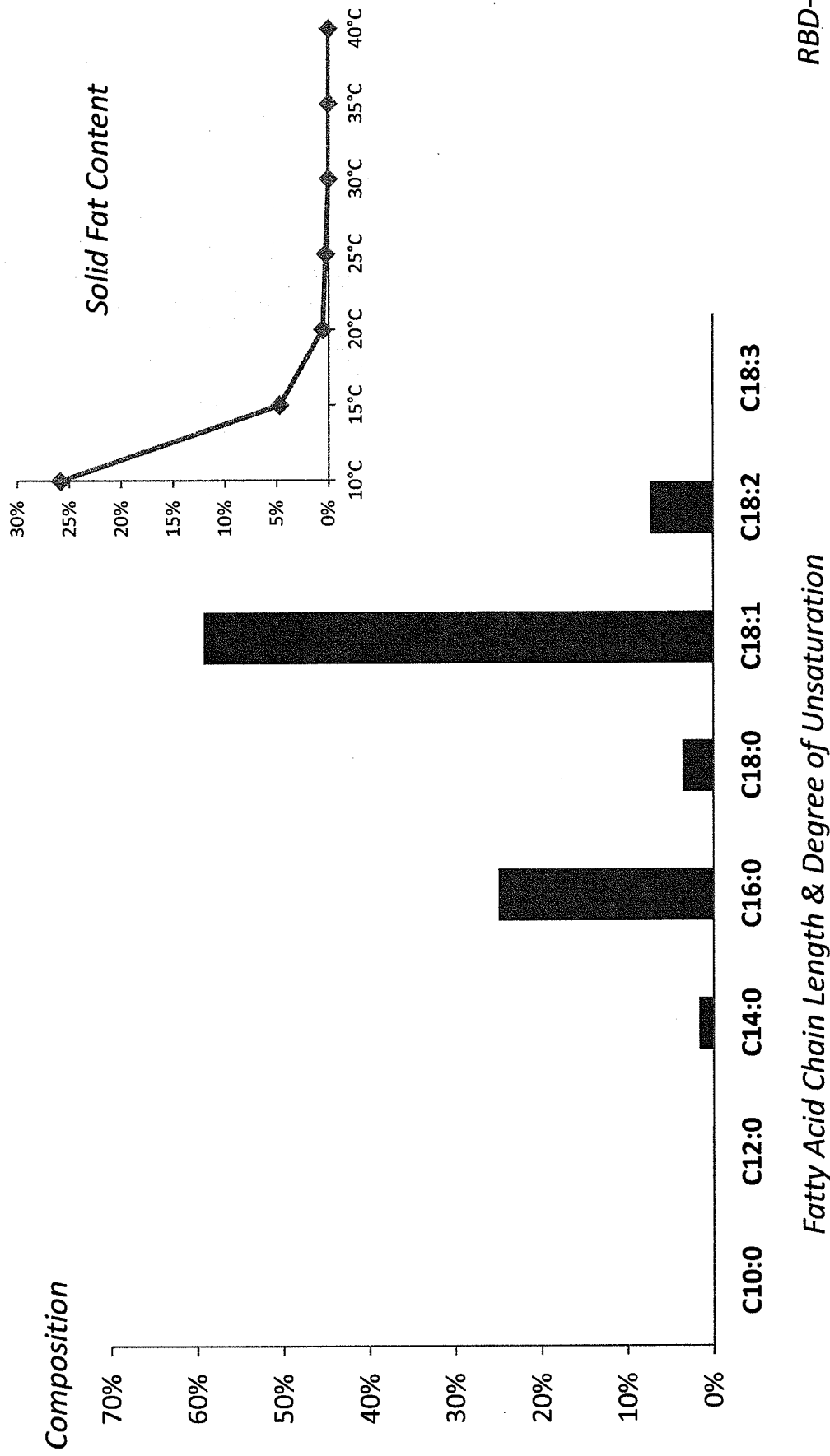


Figure 9

High-Oleic Algal Oil

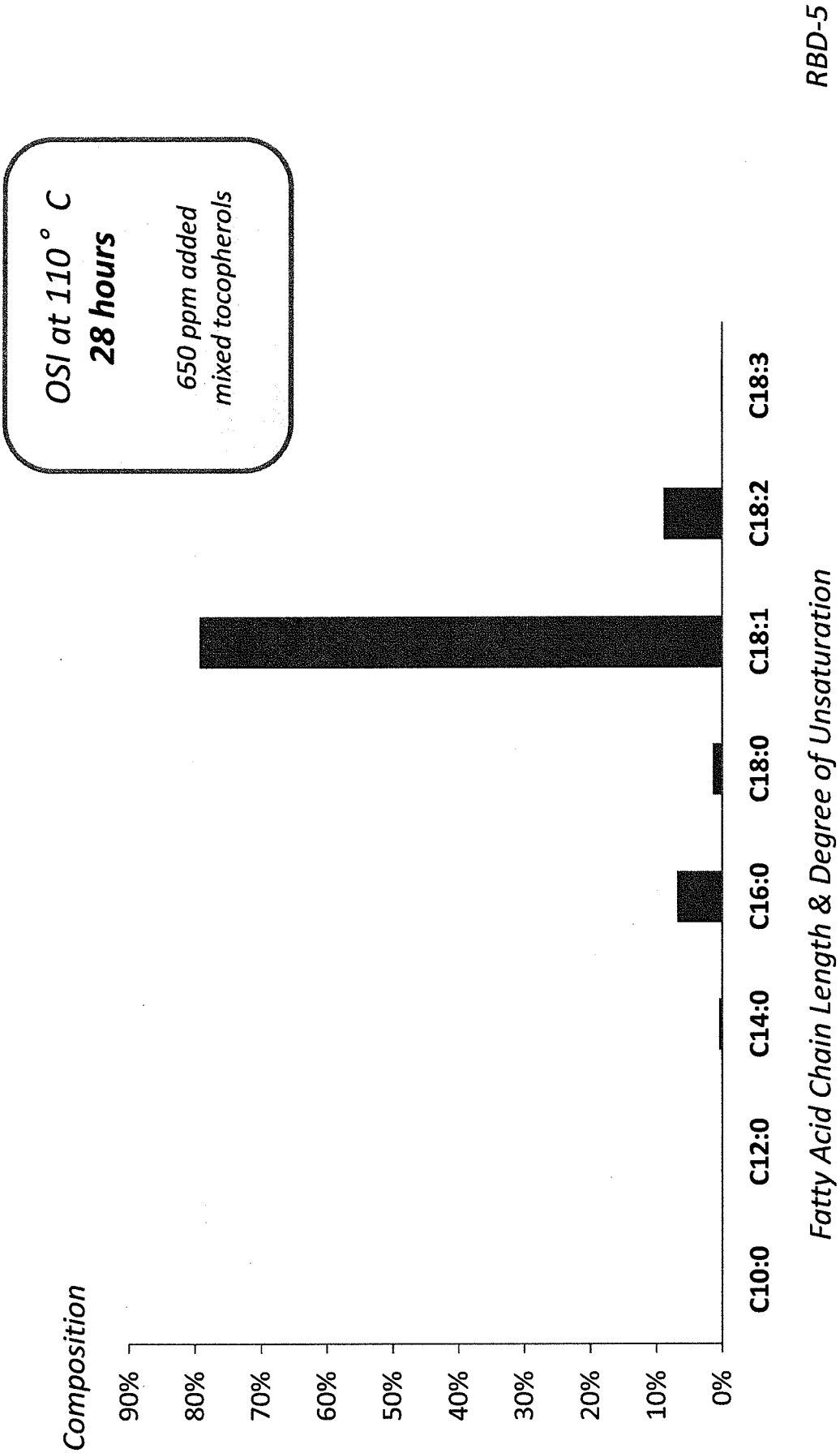


Figure 10

High-Stability Oleic Algal Oil

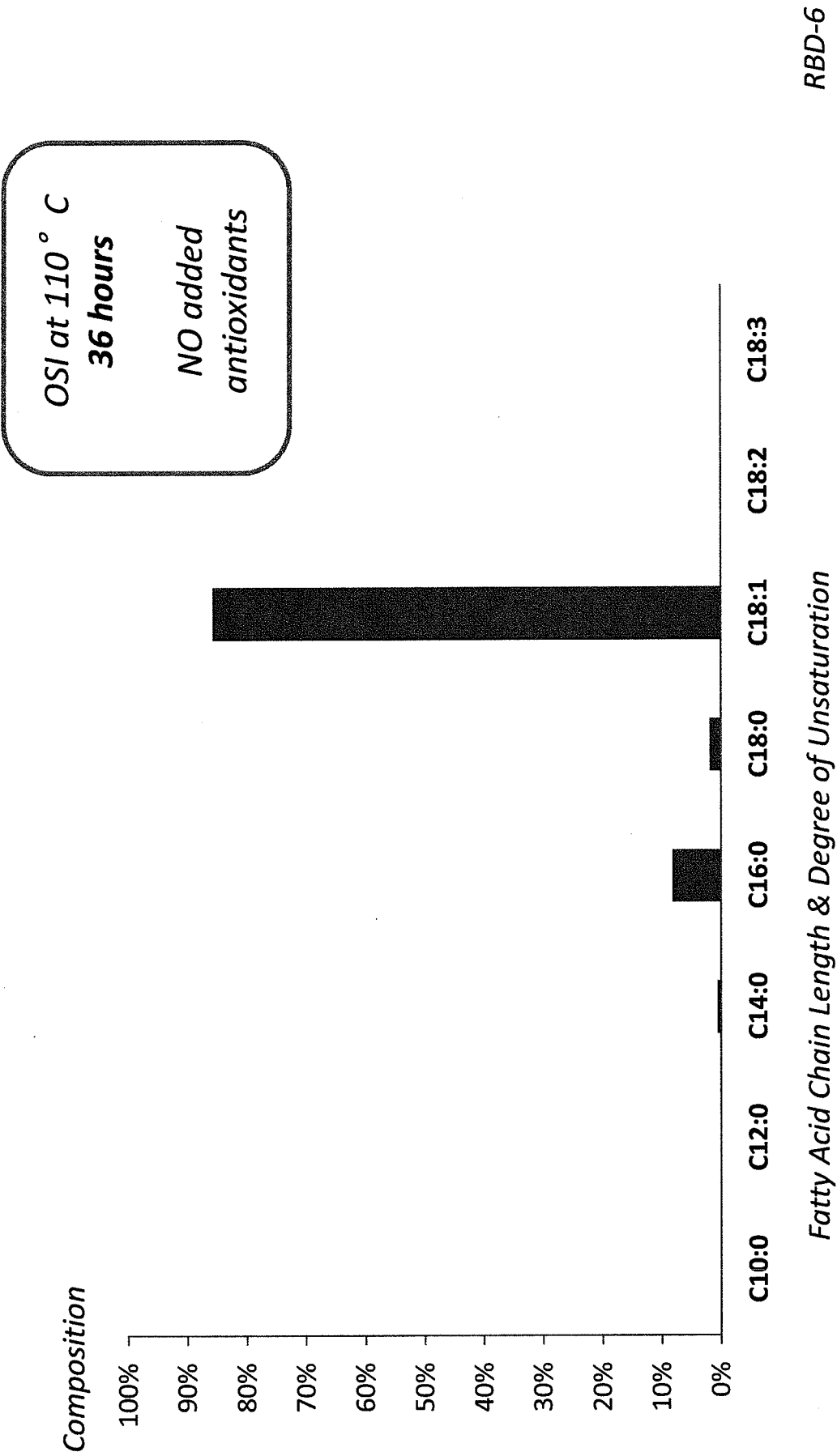


Figure 11

TEMPERING FAT / MULTIPLE TAG STRUCTURES

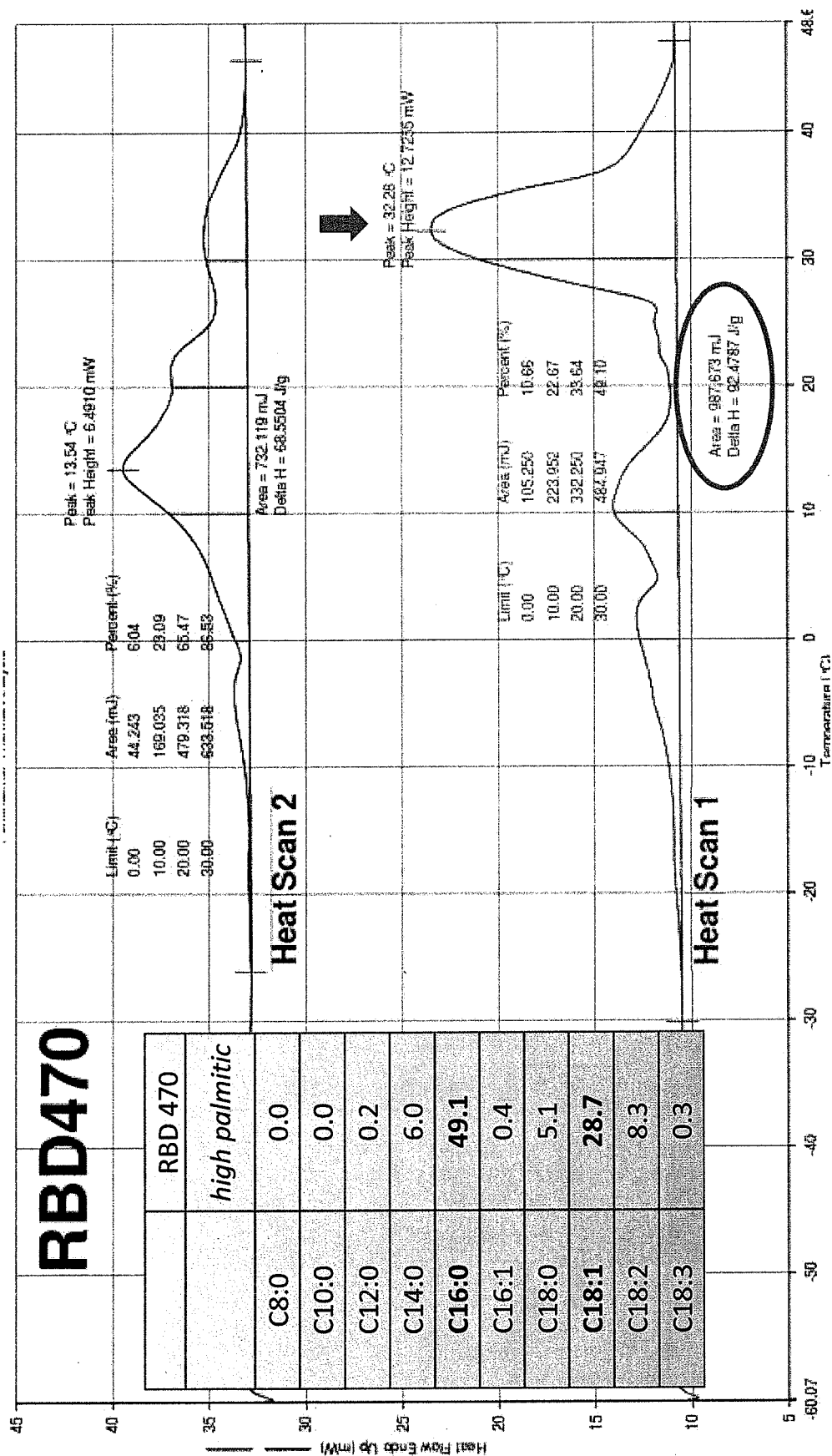


Figure 12

Lot	Name	Features	Benefits
RBD-6	High Stability Oleic Rich	Very low levels of polyunsaturates < .1% combined with very high levels of mono unsaturates (oleic) >85%	Unprecedented low levels of polyunsaturates creates perhaps the most stable natural oleic-rich oil available anywhere in the world for use in industrial and food applications. Outstanding stability and low (oxidative) reactivity is ideal for use in snack foods or spray-coating applications in foods. Combination of low pour point and oxidative stability is attractive for industrial uses such as bio-based functional fluids and lubricants. Remarkable stability minimizes need for antioxidants to be added to the oil.
RBD-5	High Oleic Sunflower Oil Mimetic	Low levels of polyunsaturates <10% combined with high levels of mono unsaturates (oleic) ~80%	Sugar-derived alternative to high oleic sunflower with better GHG profile (Brazilian production). Ideal oil for cooking and frying; balances stability with health benefits of polyunsaturates. The higher level of polyunsaturates (than high stability algal oil) lowers the pour point for food and industrial applications e.g. functional fluids.
RBD-1	Lauric Rich Alternative to Palm Kernel Oil, Coconut oil	High levels of mid-chain length saturated fatty acids (C ₁₀ -C ₁₄)	Sugar-derived alternative to palm kernel oil and coconut oil with enhanced sustainability and fatty acid profiles for the oleochemical and food industries. Enhanced mid-chain fatty acid (C10 – C14) concentration will create sharper melting fat for confectionary coating application, and efficient foaming properties in soaps. Lauric-rich oil also interesting as food oil catching wave of coconut oil as lauric is neutral-to-heart-healthy; solid sat for baking and/or confectionery.

Figure 13

Lot	Name	Features	Benefits
RBD-3	High Palmitic / Low Oleic	50% palmitic and 30% oleic; similar profile to a specialty palm mid fraction used to create structure in food products	Very efficient structuring fat for food products maximizes structuring while minimizing saturated fat content. Sharp melting profile minimizes negative impact on sensory properties of food products. Replacement for specialty palm fractions in food products; enhanced sustainability profile compared to palm
RBD-2	Myristic / Palmitic Rich	Highest level of myristic than any existing oil	Uniquely high concentration of myristic acid combined with capric and palmitic creates sharp melting profiles and higher solid fat content at low temperature than palm oil; enhanced sustainability profile compared to palm. Very unique solid fat content profile
RBD-4	High Oleic Mid Palmitic	60% oleic and 25% palmitic; higher oleic & lower palmitic than palm oil	High oleic content combined with mid palmitic levels produces very stable oil with solid fat content that makes it an excellent frying oil alternative: food product texture may be positively impacted by reduced liquid oil pick up. 30% saturated fats in range for shortening applications. Potentially good alternative to trans-fat-containing oils.

Figure 14

SOLAZYME'S HIGH OLEIC OIL

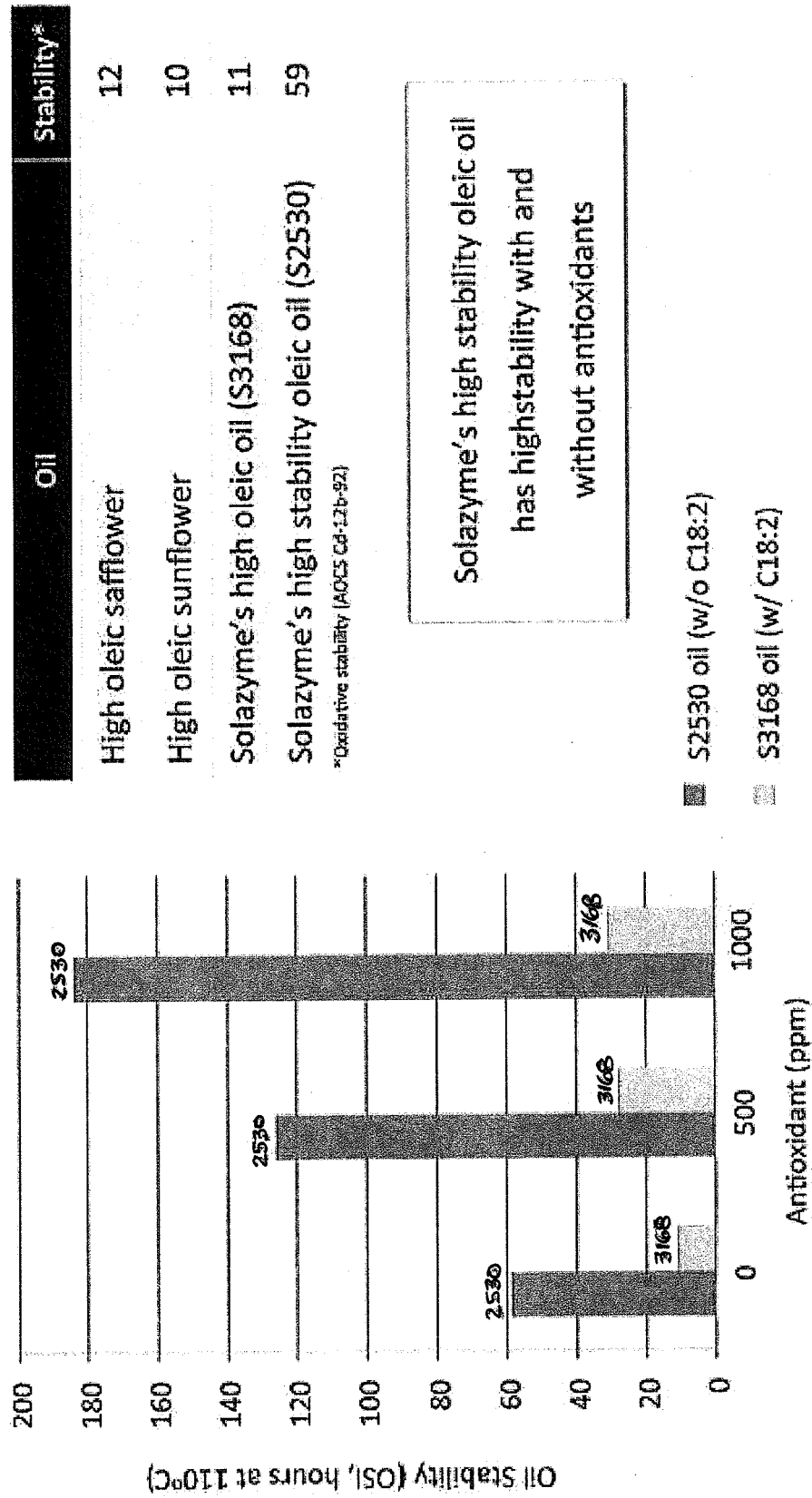


Figure 15

<i>test</i>	<i>RBD oil tested</i>	<i>result</i>	<i>test protocol</i>
OSI	RBD 502	current max: 242 hours at 110 °C	AOCS Method Cd 12b-92 (modified)
pour point	RBD 437	-19.5 °C	D97
cloud point	RBD 437	7.5 °C	AOCS Cc 6-25
flash point	RBD 437	245 °C	AOCS Cc 9b-55
viscosity	average of RBD 437 and RBD 469	41.6 cSt	Viscosity (D445) at 40 °C
viscosity index	"	195.5	Viscosity Index (D445)
color	RBD 437	2.0 Red, 18.0 Yellow	Lovibond Color AOCS Cc 13j-97 (5 1/4 inch cell)
color (converted)	RBD 437	87.3, -8.7, 32.3	Hunter Transmittance: L, a, b
bio-degradeability		Ultimate Biodegradation*	OECD 301 B

Figure 16

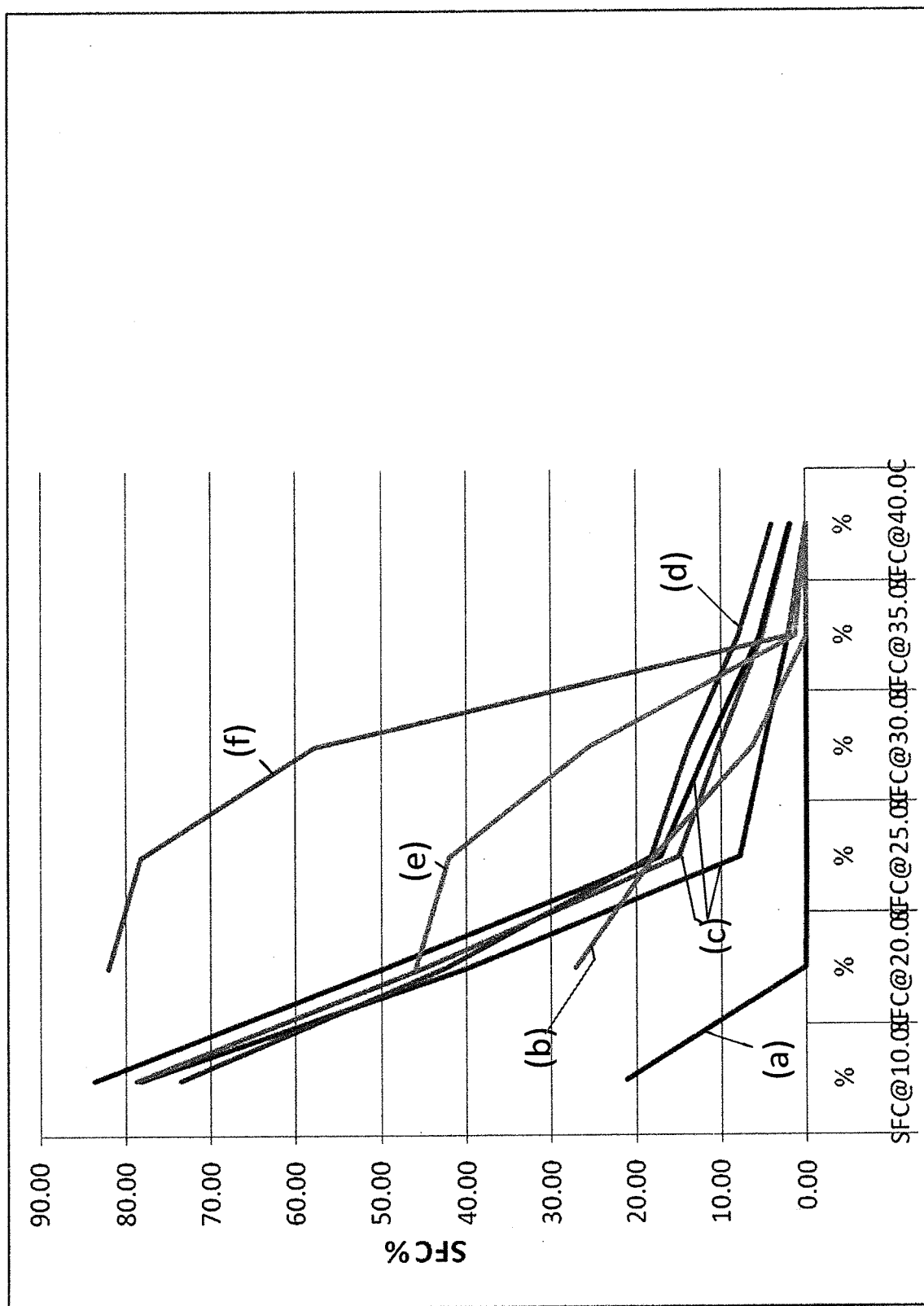


Figure 17

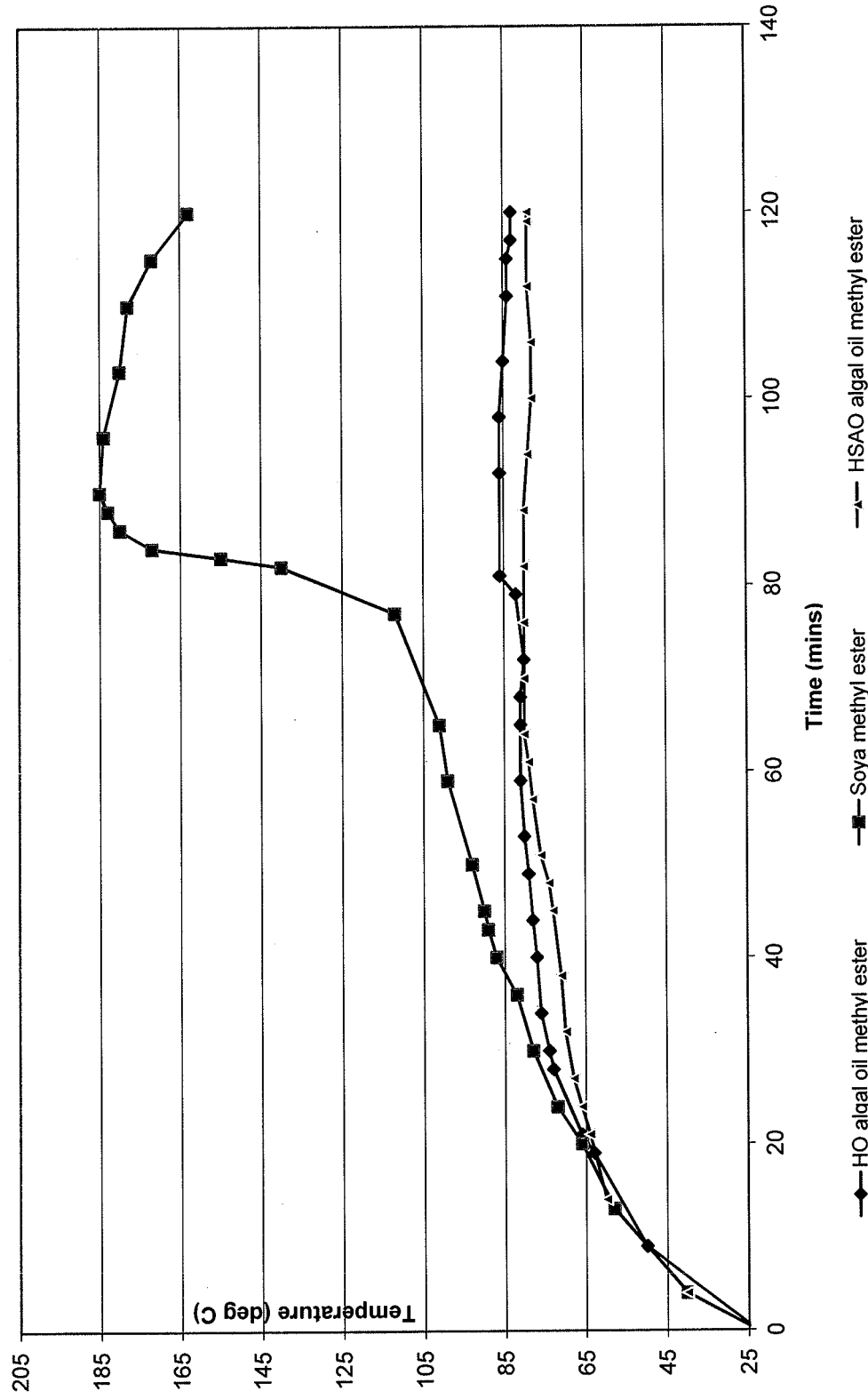


Figure 18

TEST	TEST PROTOCOL	HIGH STABILITY ALGAL OIL	HIGH OLEIC ALGAL OIL	COMMENTS ON HIGH STABILITY ALGAL OIL
OSI at 110 °C	AOCS Method Cd 12b-92	41.0 – 56.6 hours (neat) 242 hours (natural antioxidants)	14.4 hours (neat) --	HSAO outperforms natural plant-based oils with same additives
RPVOT	ASTM D2272	33 min (neat) 500 min (prelim. formulation)	30 minutes (neat) --	Neat oil outperforms neat PAO; HSAO outperforms natural plant-based oils with same additives
4-Ball wear	@ 40kg; unformulated	0.64 mm	0.60 mm	
Copper Strip Corrosion	ASTM D130, 24 hrs	1A	1A	
Pour point	ASTM D6749/D97; unformulated	-19.5 °C (neat) -29 °C (w/ pp depressant)	-21 °C (neat) --	Low pour point with high oxidative stability
Cloud point	ASTM D7683/D2500	-14 °C	-18 °C	
Flash point	D92 Cleveland Open Cup	315 °C	330 °C	Outperforms mineral oils
Viscosity	Viscosity (D445) at 40 °C	41.6 cSt	38.6 cSt	
Viscosity index	Viscosity Index (D445)	196	202	
VOCs	ASTM E1868-10	0.37% (near-zero)	nm.	Outperforms mineral oils
Biodegradability	OECD 301 B	Ultimate Biodegradation: 96% degradation by day 28	Ultimate Biodegradation: 94% degradation by day 28	Outperforms mineral oils

Figure 19

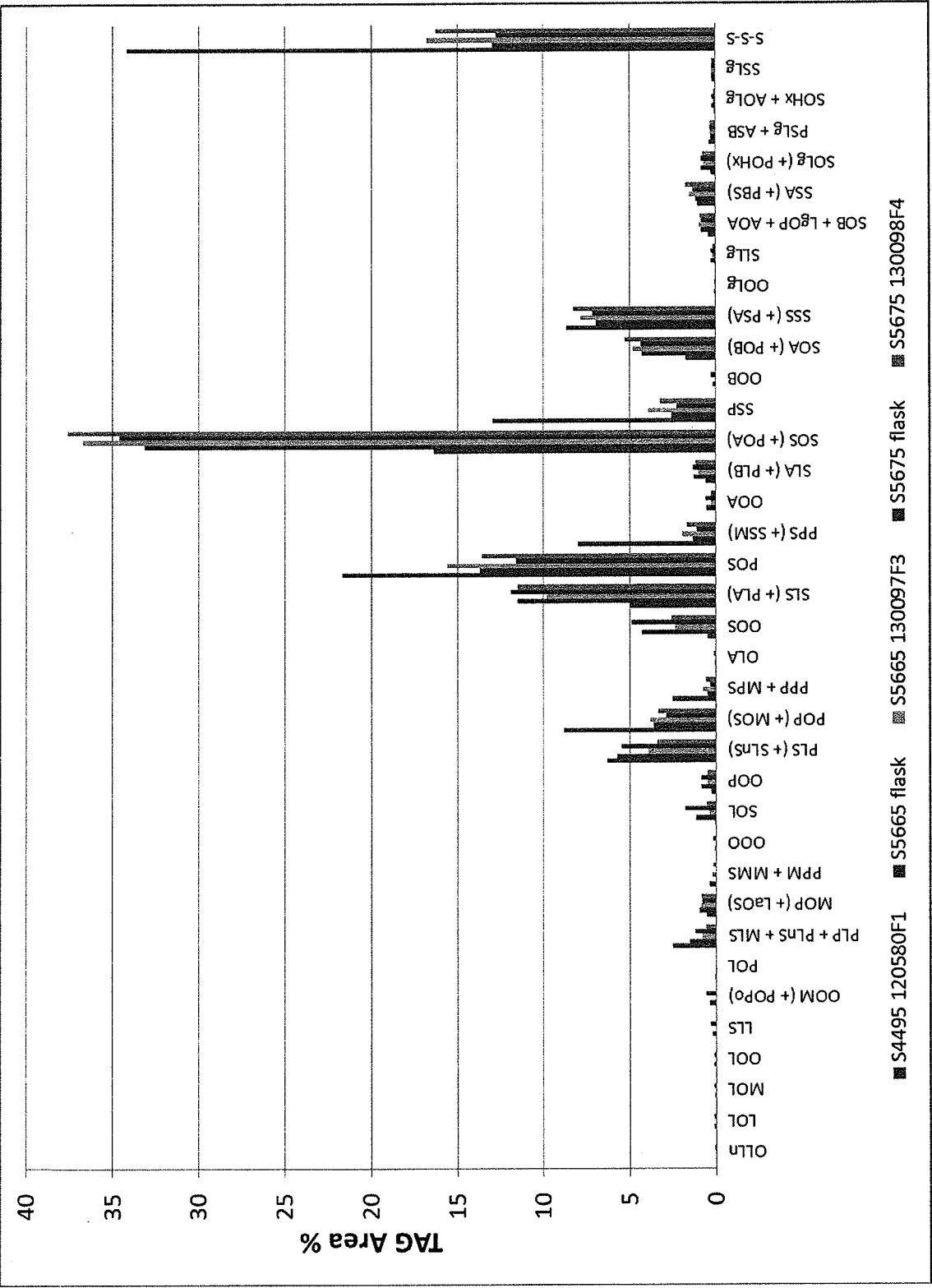


Figure 20

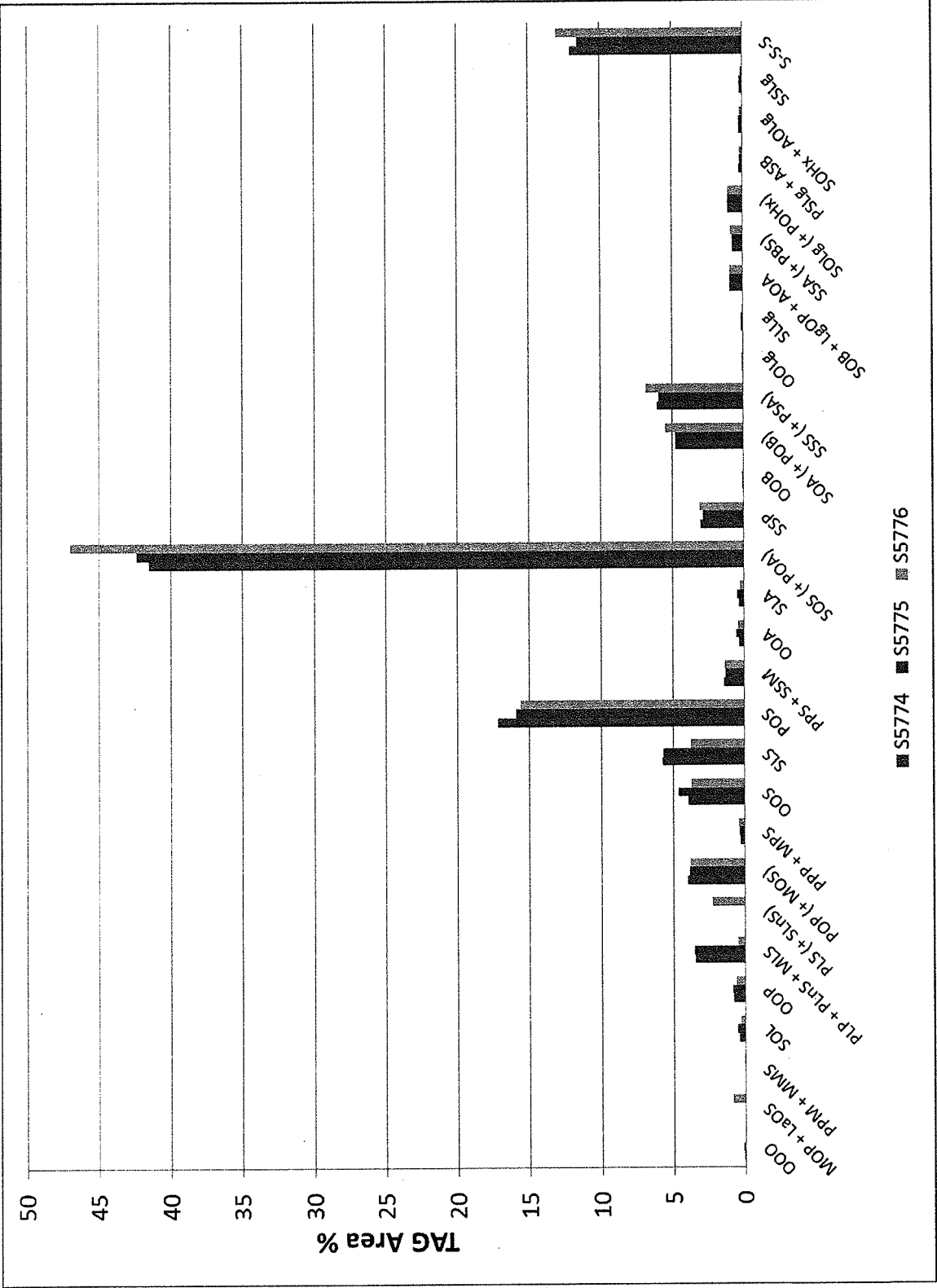


Figure 21

CHAIN LENGTH: WIDE RANGE OF ACCESSIBLE MELTING PROFILES

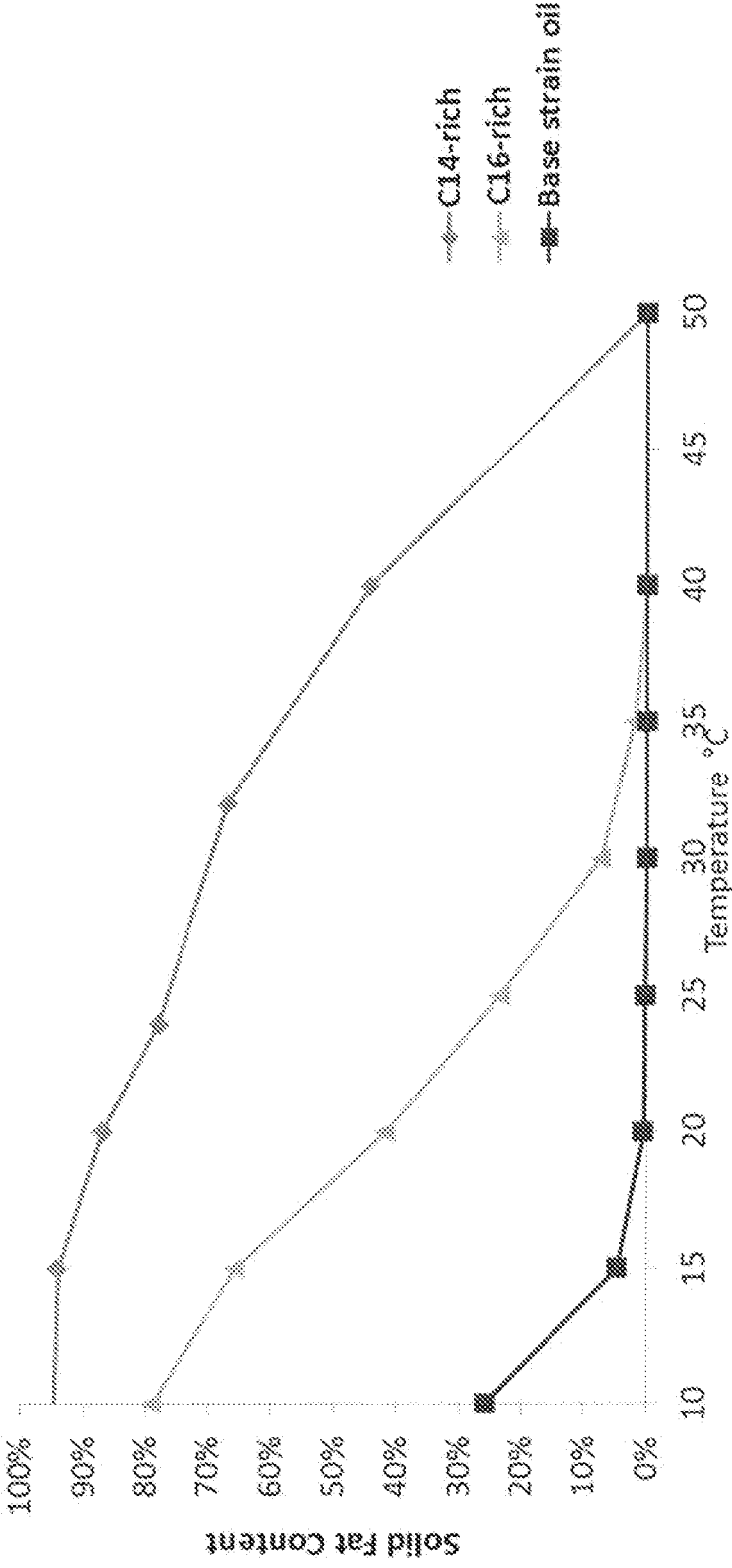


Figure 22

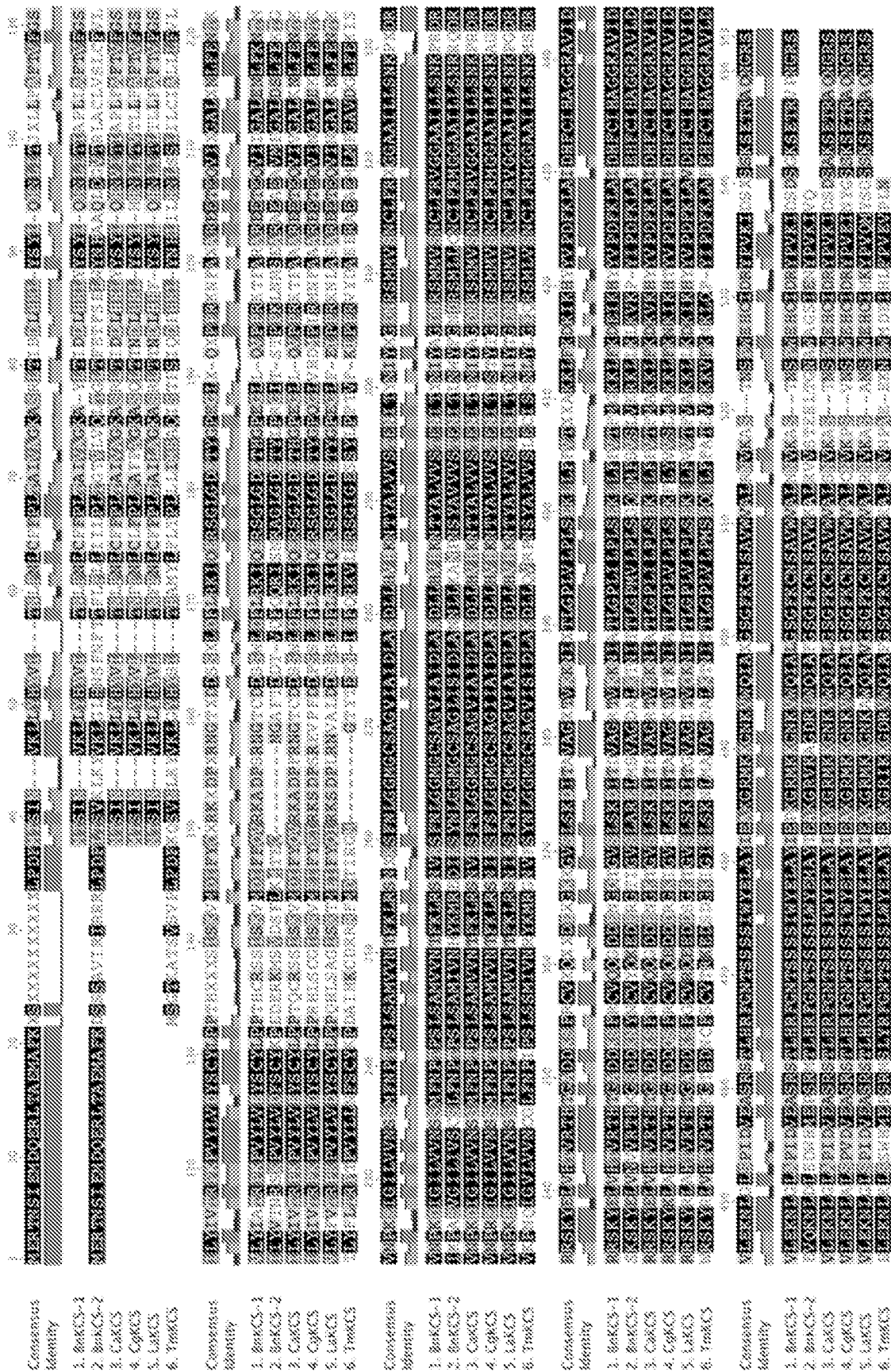


Figure 23