

# FIT OR UNFIT - ELIMINATE THE UNCERTAINTY

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# OVERVIEW

- ① Eliminating Uncertainty and Subjectivity
  - Fitness Guidelines
    - Additions
    - Fenaroli's Use Levels
      - Worksheet
- ① Current Method Development
- ① Formulas Online

# FITNESS GUIDELINES

# GUIDELINES

## ⦿ Additions to Guidelines:

- Anise Oil
- Fennel Oil
- Tartaric Acid
- Triacetin
- Washed Extracts
- 2% Total Flavor Chemicals
- Citric Acid
- Propylene Glycol



With mitigating ingredients

# FENAROLI'S USE LEVELS

- ⦿ Randomly selected tasted samples back to 1991
- ⦿ Collected and compiled formula information
  - Normalized to 15% abv
- ⦿ Compared to published use rate in Fenaroli's Handbook of Flavor Ingredients

# FENAROLI'S USE LEVELS

## ⦿ Determined:

- Any product containing at least one ingredient present at **5X or greater** than the max use level is unfit for beverage purposes
- Guideline can be used with products containing mitigating ingredients

# FENAROLI'S USE LEVELS

- ◎ Created an excel database
  - FEMA GRAS chemicals
  - Max Use Rate
    - Highest value (alcohol and nonalcoholic beverages)

## BENZYL ACETOACETATE

**Synonyms:** Benzyl acetyl acetate; Benzyl β-ketobutyrate; Benzyl 3-oxobutanoate; **Acetoacetic acid, benzyl ester (8CI)**; Benzyl acetylacetate; Benzyl 3-oxobutanoate; **Butanoic acid, 3-oxo-, phenylmethyl ester (9CI)**; Phenylmethyl 3-oxobutanoate

CAS No.: 5396-89-4	FL No.: 09.406	FEMA No.: 2136	NAS No.: 2136
CoE No.: 244	EINECS No.: 226-416-4	JECFA No.: 848	

**Description:** Benzyl acetoacetate has a sweet, floral, fresh, balsamic, fruity odor similar to that of ethyl acetate.

**Consumption:** Annual: <1.00 lb Individual: 0.00000149 mg/kg/day

### Regulatory Status:

CoE: Used provisionally. Bev.: 3 ppm; Food: 10 ppm

FDA: 21 CFR 172.515

FDA (other): n/a

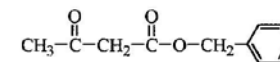
JECFA: ADI: Acceptable; No safety concern at current levels of intake when used as a flavoring agent (2001).

**Trade association guidelines:** FEMA PADI: 4.791 mg

IOFI: n/a

### Empirical Formula/MW:

C<sub>11</sub>H<sub>12</sub>O<sub>3</sub>/192.22



### Specifications: (Burdock, 1997)

Appearance	Oily liquid
Melting point	Approx. 240°C (162-164°C at 16 mmHg)

Solubility	Soluble in alkali solutions at room temperature
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### Reported uses (ppm): (FEMA, 1994)

Food Category	Usual	Max.
Alcoholic beverages	2.00	5.00
Baked goods	27.09	43.49
Chewing gum	19.00	37.45
Frozen dairy	11.02	22.21

Food Category	Usual	Max.
Gelatins, puddings	16.00	27.56
Nonalcoholic beverages	3.00	5.81
Soft candy	14.60	22.33

**Synthesis:** By heating ethyl acetoacetate and benzyl alcohol to 160°C.

**Aroma threshold values:** n/a

**Taste threshold values:** n/a

**Natural occurrence:** Reported found in litchi (*Litchi sinensis* Sonn.).





# Flavor Unfitness Worksheet

*Don't know how to use this worksheet? See the instructions below!*

<b>Formula Information:</b>	
<b>Total Weight</b>	<b>100</b>
<b>Alcohol content (high end of box #10)</b>	<b>33.4</b>

FEMA #	Ingredient	Weight of ingredient	ppm in flavor	ppm @ 15% ABV	MAX Use Level	Factor higher MAX Use Level	Fit or Unfit?	Remarks
2427	ETHYL BUTYRATE	0.04	400.0	179.6	37.88	4.7	FIT	-
2560	2-HEXENAL	0.01	100.0	44.9	6.7	6.7	UNFIT	-
-	-	-	0.0	0.0	-	-	-	-
-	-	-	0.0	0.0	-	-	-	-
-	-	-	0.0	0.0	-	-	-	-
-	-	-	0.0	0.0	-	-	-	-
-	-	-	0.0	0.0	-	-	-	-
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-	-	-	0.0	0.0	-	-	-	-
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-	-	-	0.0	0.0	-	-	-	-
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-	-	-	0.0	0.0	-	-	-	-

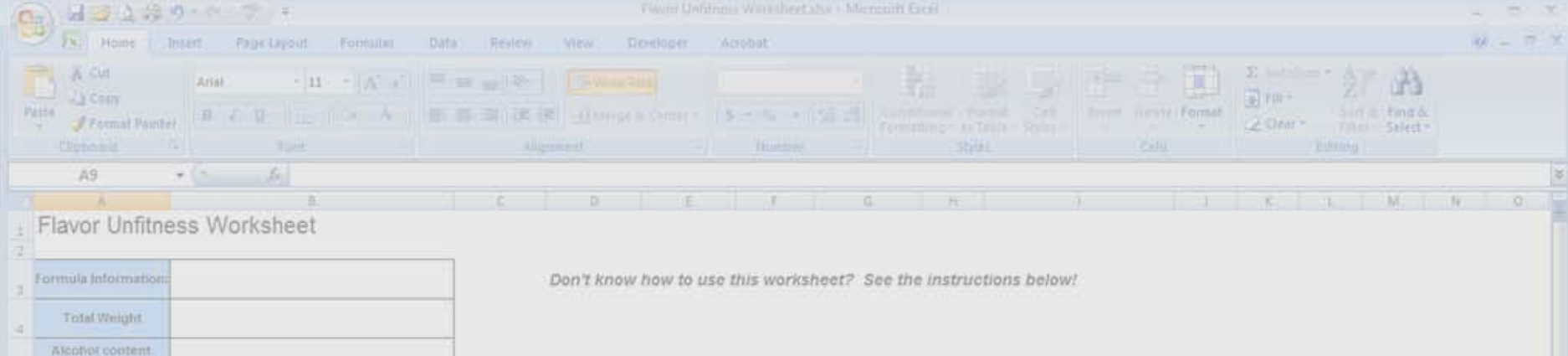
'FIT' or 'UNFIT' will display after values are entered.



# FENAROLI'S USE LEVELS

- ◎ Materials excluded from this guideline:
  - Ingredients with established guidelines
    - Ex: PG, ethyl acetate, etc...
  - Materials found to be fit at 1% or 0.1%
    - Ex: isoamyl acetate, limonene
  - TTB and FDA limited ingredients

FEMA #	Ingredient	Weight of ingredient	ppm in flavor	ppm @ 15% ABV	MAX Use Level	Factor higher MAX Use Level	Fit or Unfit?
2414	ETHYL ACETATE		0.0	0.0	REMOVED	-	-
2656	MALTOL		0.0	0.0	REMOVED	-	-
2633	LIMONENE (d,l-, and dl-)		0.0	0.0	REMOVED	-	-
2489	FURFURAL		0.0	0.0	REMOVED	-	-
2940	PROPYLENE GLYCOL		0.0	0.0	REMOVED	-	-




- How to Use This Worksheet:**
1. Enter in the formula information (name, TTB #, etc), total weight of the final product, and the alcohol content (high end of box #10).
  2. Enter the FEMA number. If you do not know it, search the tab 'GRAS Materials.' Once the FEMA # is entered, the name of the ingredient will automatically appear.
  3. Enter the weight of the ingredient. NOTE: The units of total weight and individual ingredient must match!
  4. All other calculations will be done automatically. If the amount of the ingredient is at least 5X the Max Use Rate, then the final product is unfit.

**Other Guidelines:**

- Worksheets for the other guidelines found in the Drawback Tutorial are on the other tabs in this worksheet. Use the appropriate tab based on the units used.



# GRAS MATERIALS TAB

*Hint:  
Use ctrl-f  
(find function)  
to quickly  
search the  
list.*

The screenshot shows a Microsoft Excel spreadsheet titled "Flavor Unfitness Worksheet.xlsx". The spreadsheet has columns A through J. The data is organized into rows, with the first row (row 559) containing the following information:

Row	Column A	Column B	Column C	Column D
559	8012-89-3	2126	Beeswax	Beeswax, white (Apis mellifera L.)
560	8012-89-3	2126	Beeswax, white (Apis mellifera L.)	
561	8012-89-3	2126	Cire d'abeille absolute	Beeswax, white (Apis mellifera L.)
562	100-52-7	2127	Benzaldehyde	
563	100-52-7	2127	Benzenecarbonal	Benzaldehyde
564	100-52-7	2127	Benzene carboxaldehyde	Benzaldehyde
565	100-52-7	2127	Benzenemethylal	Benzaldehyde
566	100-52-7	2127	Benzoic aldehyde	Benzaldehyde
567	100-52-7	2127	Bitter almond oil, synthetic	Benzaldehyde
568	1125-88-8	2128	Benzaldehyde dimethyl acetal	
569	1125-88-8	2128	Benzene, (dimethoxymethyl)-	Benzaldehyde dimethyl acetal
570	1125-88-8	2128	alpha,alpha-Dimethoxytoluene	Benzaldehyde dimethyl acetal
571	1319-88-6	2129	Benzaldehyde, cyclic acetal with glycerol	Benzaldehyde glyceryl acetal
572	1319-88-6	2129	Benzaldehyde glyceryl acetal	
573	1319-88-6	2129	Benzalglycerin	Benzaldehyde glyceryl acetal
574	1319-88-6	2129	1,3-Dioxolane-4-methanol, 2-phenyl-	Benzaldehyde glyceryl acetal
575	1319-88-6	2129	4-Hydroxymethyl-2-phenyl-m-dioxolane	Benzaldehyde glyceryl acetal
576	1319-88-6	2129	5-Hydroxy-2-phenyl-1,3-dioxane	Benzaldehyde glyceryl acetal
577	1319-88-6	2129	2-Phenyl-1,3-dioxan-5-ol	Benzaldehyde glyceryl acetal
578	1319-88-6	2129	2-Phenyl-m-dioxan-5-ol	Benzaldehyde glyceryl acetal
579	2568-25-4	2130	Benzaldehyde propylene glycol acetal	
580	2568-25-4	2130	1,3-Dioxolane, 4-methyl-2-phenyl-	Benzaldehyde propylene glycol acetal
581	2568-25-4	2130	4-Methyl-2-phenyl-1,3-dioxolane	Benzaldehyde propylene glycol acetal
582	2568-25-4	2130	4-Methyl-2-phenyl-m-dioxolane	Benzaldehyde propylene glycol acetal
583	65-85-0	2131	Benzenecarboxylic acid	Benzoic acid
584	65-85-0	2131	Benzoic acid	
585	65-85-0	2131	Dracylic acid	Benzoic acid
586	119-53-9	2132	Benzoin	
587	119-53-9	2132	Benzoyl phenyl carbinol	Benzoin
588	119-53-9	2132	Ethanone, 2-hydroxy-1,2-diphenyl-	Benzoin
589	119-53-9	2132	alpha-Hydroxy-alpha-phenylacetophenone	Benzoin
590	119-53-9	2132	2-Hydroxy-2-phenylacetophenone	Benzoin
591	9000-05-9	2133	Benzoin resin	Benzoin resinoid
592	9000-05-9	2133	Benzoin resinoid	
593	9000-05-9	2133	Gum benzoin	Benzoin resinoid
594	119-61-9	2134	Benzophenone	

A "Find and Replace" dialog box is open over the spreadsheet. The "Find" tab is selected. The "Find what:" field contains the text "benzaldehyde". The "Find All" button is highlighted. The "Options >>" button is also visible.

# COMPONENT WS TAB

available for lbs/gal and g/mL

Flavor Unfitness Worksheet.xlsx - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Developer Acrobat

Cut Copy Paste Format Painter Clipboard Font Alignment Number Styles Cells Editing

B114

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
103																		
104		<b>Vanillin</b>	<b>3.2 av.oz./gal at 95% v/v ethanol</b>															
105			Alcohol Content (upper end of range in item 10)	Minimum Value Needed to Make Product Unfit		Amount of Vanillin (pounds)	Volume of Final Product (gallons)	av.oz. / gal of Vanillin	Unfit?									
106				0.000				-	-									
107																		
108		<b>Washed Extracts</b>	<b>6.33% by weight at 95% v/v ethanol</b>															
109			Alcohol Content (upper end of range in item 10)	Minimum Value Needed to Make Product Unfit (wt%)		Amount of Oil (pounds)	Weight of Final Product (pounds)	% by weight of Oil	Unfit?									
110				0.00				-	-									
111																		
112		<b>Flavor Chemicals unfit at 1%</b>	<b>1% by weight at 95% v/v ethanol</b>															
113			Alcohol Content (upper end of range in item 10)	Minimum Value Needed to Make Product Unfit		Amount of Flavor Chemical (pounds)	Weight of Final Product (pounds)	% by weight of Flavor Chemical	Unfit?									
114				0.158				-	-									
115			<i>(cannot be scaled below 15% alcohol)</i>															
116		<b>Total Flavor Chemicals</b>	<b>2% by weight at 95% v/v ethanol</b>					<i>(chemicals must be listed on the 1% list)</i>										
117			Alcohol Content (upper end of range in item 10)	Minimum Value Needed to Make Product Unfit		Amount of Flavor Chemicals (pounds)	Weight of Final Product (pounds)	% by weight of Flavor Chemicals	Unfit?									
118				0.316				-	-									
119			<i>(cannot be scaled below 15% alcohol)</i>															
120																		
121																		
122																		
123																		

Ready Flavor Unfitness Worksheet Component WS (lbs-gal) Component WS (g-mL) GRAS Materials 90%

**DEPARTMENT OF THE TREASURY  
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS  
FORMULA AND PROCESS FOR NONBEVERAGE PRODUCT**

*(See instructions attached-Prepare in triplicate, except if manufactured abroad)*

<b>3. NAME OF PRODUCT.</b>  <div style="font-size: 1.2em; font-weight: bold;">Natural Raspberry Flavor WONF</div>			<b>4. CHECK IF SAMPLE WILL BE SUBMITTED</b>  <input type="checkbox"/>	<b>5. NUMBER OF DAYS TO COMPLETE PROCESS</b>  <div style="font-size: 1.2em; font-weight: bold;">1</div>	<b>1. FORMULA NUMBER</b>  <div style="font-size: 1.2em; font-weight: bold;">15</div>																
			<b>2. KIND (e.g. Alcohol, Rum)</b>  PROOF OF SPIRITS ON WHICH DRAWBACK WILL BE CLAIMED.  <div style="text-align: center;">Alcohol 190 proof</div>																		
<b>6. NAME OF THE MANUFACTURER &amp; ADDRESS WHERE PRODUCTS WILL BE PRODUCED ( if multiple production sites, list other addresses on reverse).</b>  Company A 6000 Ammendale Rd Beltsville, MD 20705		<b>7. CHECK KIND OF PRODUCT:</b> <input type="checkbox"/> MEDICINE/ MEDICINAL PREPARATION <input checked="" type="checkbox"/> FLAVOR/ FLAVORING EXTRACT <input type="checkbox"/> FOOD PRODUCT                      PERFUME		<b>8. FORMULAS SUPERSEDED.</b>  																	
<b>9. ELIGIBLE ABSOLUTE ALCOHOL VOLUME USED. (See instructions)</b>  <div style="text-align: center; font-size: 1.2em; font-weight: bold;">42.6%</div>		<b>10. ALCOHOL CONTENT BY VOLUME OF FINISHED PRODUCT.</b>  <div style="text-align: center; font-size: 1.2em; font-weight: bold;">42.6 +/- 2.0%</div>																			
<b>11. IF MADE WITH RECOVERED SPIRITS: ELIGIBLE PLUS RECOVERED ABSOLUTE ALCOHOL BY VOLUME USED. (See instructions).</b>  		<b>12. IF FINISHED PRODUCT IS TO BE USED IN ALCOHOLIC BEVERAGES:</b> A. DOES PRODUCT CONTAIN NATURAL FLAVORING? (YES OR NO) B. DOES PRODUCT CONTAIN GREATER THAN 0.1% ARTIFICIAL FLAVORING(Excluding Vanillin, Ethyl Vanillin,Maltol, Ethyl Maltol)? (Yes or No) C. STATE PARTS PER MILLION IN PRODUCT OF:   VANILLIN    ETHYL VANILLIN <div style="text-align: center;">                     SYNTHETIC MALTOL    ETHYL MALTOL                 </div> D. DOES PRODUCT CONTAIN A COLOR ADDITIVE?    IF YES, WHICH? E. ARE ALL INGREDIENTS APPROVED BY FDA FOR USE WITHOUT LIMITATION OR RESTRICTION? (YES OR NO)																			
<b>13. FORMULA AND PROCESS(Use Additional Space on Reverse if Necessary).</b>																					
<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"><b>Ethanol 190 proof</b></td> <td style="text-align: right; font-weight: bold;"><b>35 lbs (5.15 gal)</b></td> </tr> <tr> <td><b>Glycerine</b></td> <td style="text-align: right; font-weight: bold;"><b>25 lbs</b></td> </tr> <tr> <td><b>Citric Acid</b></td> <td style="text-align: right; font-weight: bold;"><b>9.4 lbs</b></td> </tr> <tr> <td><b>Raspberry Essence (purchased 3% abv)</b></td> <td style="text-align: right; font-weight: bold;"><b>1 lb (.13 gal)</b></td> </tr> <tr> <td><b>Natural Acetic Acid</b></td> <td style="text-align: right; font-weight: bold;"><b>0.5 lbs</b></td> </tr> <tr> <td><b>Nat Ethyl Butyrate (0.04 lbs) and other natural esters</b></td> <td style="text-align: right; font-weight: bold;"><b>0.1 lbs</b></td> </tr> <tr> <td><b>Water</b></td> <td style="text-align: right; font-weight: bold;"><b>29 lbs</b></td> </tr> <tr> <td colspan="2" style="text-align: center; padding-top: 20px;"> <b>Theoretical Yield    100 lbs (11.5 gal)</b> </td> </tr> </table>						<b>Ethanol 190 proof</b>	<b>35 lbs (5.15 gal)</b>	<b>Glycerine</b>	<b>25 lbs</b>	<b>Citric Acid</b>	<b>9.4 lbs</b>	<b>Raspberry Essence (purchased 3% abv)</b>	<b>1 lb (.13 gal)</b>	<b>Natural Acetic Acid</b>	<b>0.5 lbs</b>	<b>Nat Ethyl Butyrate (0.04 lbs) and other natural esters</b>	<b>0.1 lbs</b>	<b>Water</b>	<b>29 lbs</b>	<b>Theoretical Yield    100 lbs (11.5 gal)</b>	
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<b>Theoretical Yield    100 lbs (11.5 gal)</b>																					
<div style="font-size: 1.2em; font-weight: bold;">Simple Mixture</div>																					

**Citric Acid**

Ethanol ≤ 30% v/v – acid must be ≥ [(0.1 × ethanol %) + 0.5] (g/100 mL)

Ethanol > 30% v/v – acid must be ≥ [0.1 × ethanol %] (g/100 mL)

Ethanol ≤ 30% v/v

Alcohol Content (upper end of range in item 10)	Minimum Value Needed to Make Product Unfit
	0.500

Amount of Citric Acid (pounds)	Volume of Final Product (gallons)	g / 100 mL of Citric Acid	Unfit?
		-	-

Needed (if product contains mitigating ingredients)	Unfit?
1.000	-

Ethanol > 30% v/v

Alcohol Content (upper end of range in item 10)	Minimum Value Needed to Make Product Unfit
44.6	4.460

Amount of Citric Acid (pounds)	Volume of Final Product (gallons)	g / 100 mL of Citric Acid	Unfit?
9.4	11.5	9.794720235	<b>YES</b>

Needed (if product contains mitigating ingredients)	Unfit?
8.920	<b>YES</b>

Company A  
6000 Ammendale Rd  
Beltsville, MD 20705

FLAVOR/ FLAVORING EXTRACT  
 FOOD PRODUCT       PERFUME

9. ELIGIBLE ABSOLUTE ALCOHOL VOLUME USED. (See instructions)  
**42.6%**

10. ALCOHOL CONTENT BY VOLUME OF FINISHED PRODUCT.  
**42.6 +/- 2.0%**

11. IF MADE WITH RECOVERED SPIRITS: ELIGIBLE PLUS RECOVERED ABSOLUTE ALCOHOL BY VOLUME USED. (See instructions).

12. IF FINISHED PRODUCT IS TO BE USED IN ALCOHOLIC BEVERAGES:

A. DOES PRODUCT CONTAIN NATURAL FLAVORING? (YES OR NO)

B. DOES PRODUCT CONTAIN GREATER THAN 0.1% ARTIFICIAL FLAVORING? (Excluding Vanillin, Ethyl Vanillin, Maltol, Ethyl Maltol) (Yes or No)

C. STATE PARTS PER MILLION IN PRODUCT OF: VANILLIN      ETHYL VANILLIN  
SYNTHETIC MALTOL      ETHYL MALTOL

D. DOES PRODUCT CONTAIN A COLOR ADDITIVE? IF YES, WHICH?

E. ARE ALL INGREDIENTS APPROVED BY FDA FOR USE WITHOUT LIMITATION OR RESTRICTION? (YES OR NO)

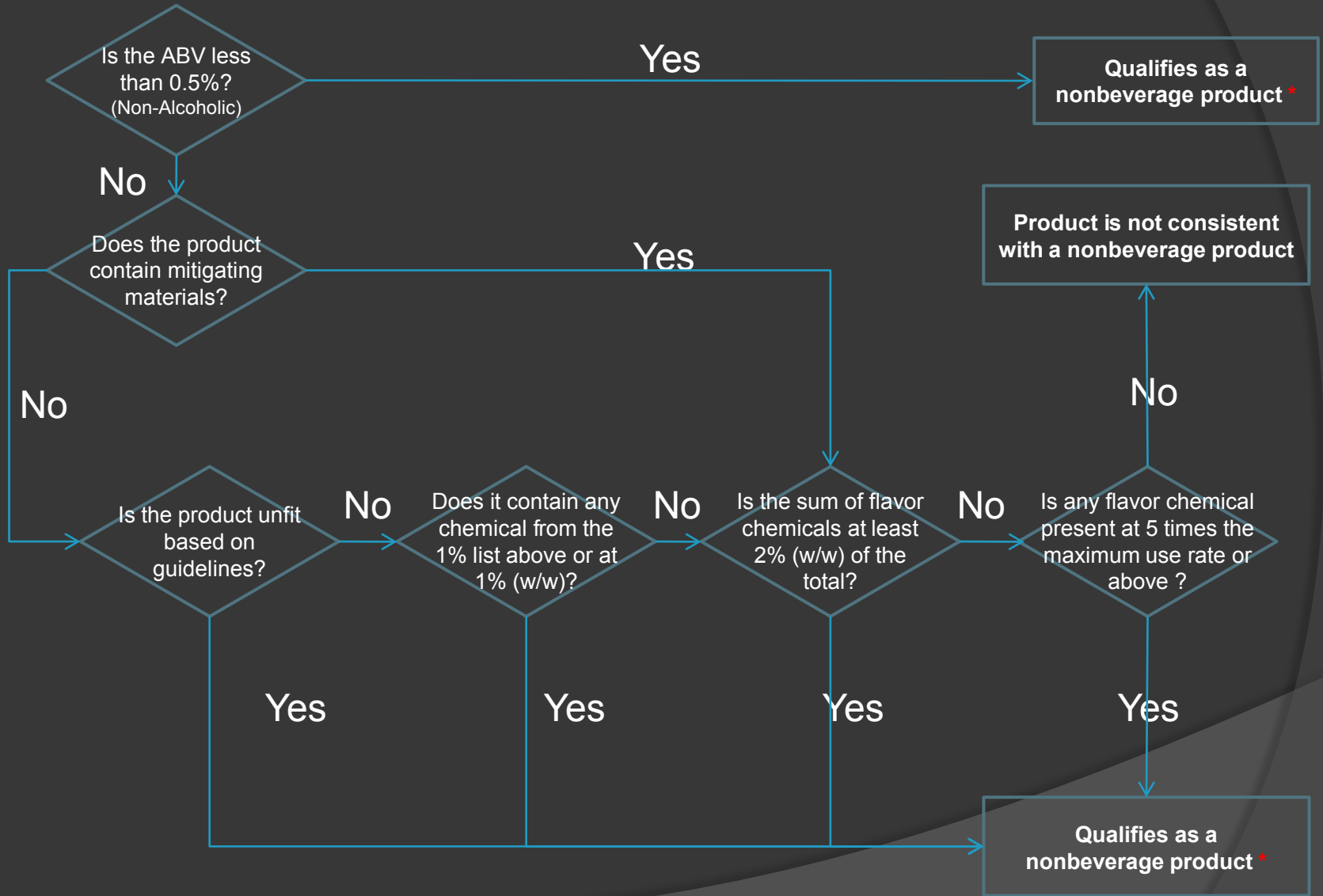
13. FORMULA AND PROCESS (Use Additional Space on Reverse if Necessary)

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<b>Glycerine</b>	<b>25 lbs</b>
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<b>Raspberry Essence (purchased 3% abv)</b>	<b>1 lb (.13 gal)</b>
<b>Natural Acetic Acid</b>	<b>0.5 lbs</b>
<b>Nat Ethyl Butyrate (0.04 lbs) and other natural esters</b>	<b>0.1 lbs</b>
<b>Water</b>	<b>29 lbs</b>
<b>Theoretical Yield</b>	<b>100 lbs (11.5 gal)</b>

**Simple Mixture**



# NONBEVERAGE FITNESS DETERMINATION PROCESS



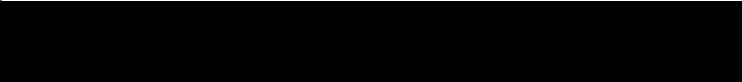
\* Submissions must also meet other TTB regulations regarding name, GRAS ingredients and alcohol content calculations

# CURRENT METHOD DEVELOPMENT

# CURRENT METHOD DEVELOPMENT

- ⦿ Vanillin/ Ethyl Vanillin/ Maltol / Ethyl Maltol
- ⦿ Vanilla Extracts
- ⦿ Caffeine
- ⦿ Ethyl Isobutyrate  
2-Methyl Butyrate  
Ethyl Butyrate  
Myrcene  
Limonene  
cis-3-Hexenol  
Cinnamyl Alcohol
- Linalool  
Menthol  
Ethyl Benzoate  
Benzyl Alcohol  
Thymol  
Anisyl Alcohol

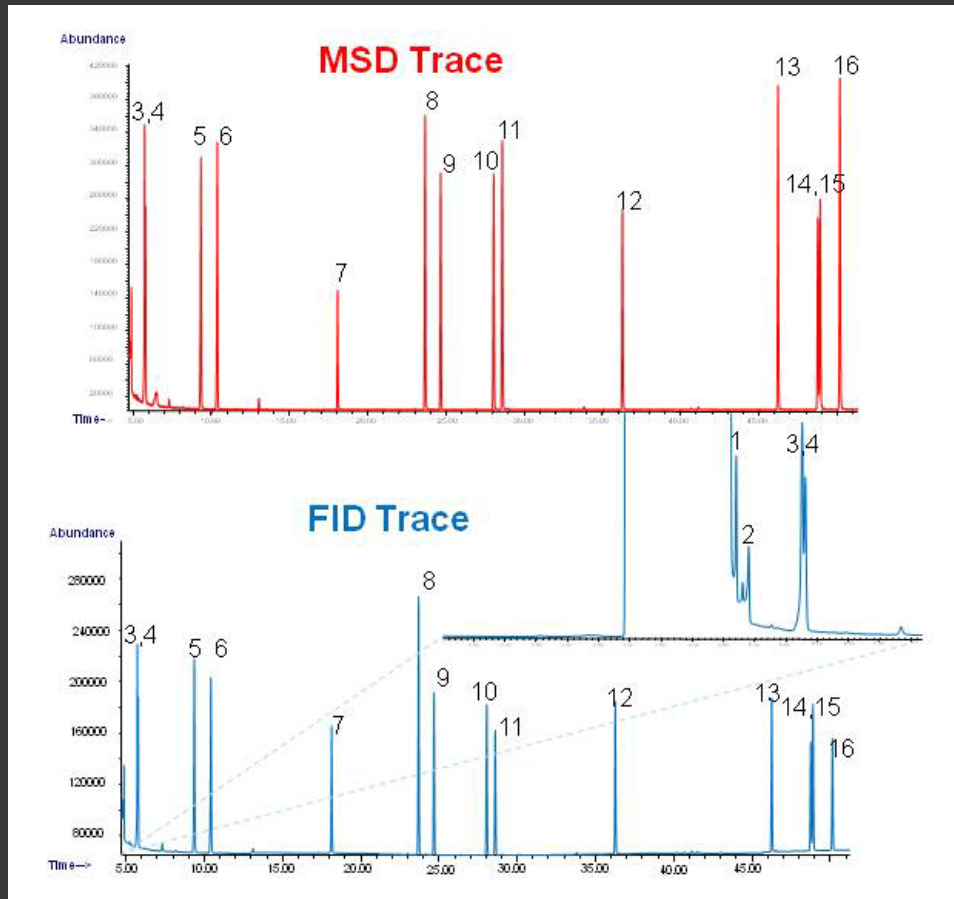
# CURRENT METHOD DEVELOPMENT

- Multi-lab method validation
- 13 commonly used flavor chemicals
- Analysis for compliance and fitness determination
  
- Contact: Ed Limowski
  - 

# INSTRUMENTATION AND EXPERIMENTAL CONDITIONS

Gas chromatograph	Agilent 6890
Autosampler	Gerstel MPS 2
Autosampler mode	Liquid
Injection volume	1 $\mu$ L
Inlet	250 °C; 5:1 split
Oven profile	40 °C 2'; 3 °C/min 240 °C; 1.0'
Post run	240 °C for 5 min
Backflush inlet flow	0.1 mL/min
Backflush pressure splitter	60 PSI
Column	Phenomenex ZB-WAXplus
Column dimensions	30 m $\times$ 0.25 mm $\times$ 0.25 $\mu$ m
Pressure at splitter	20 PSI
Restrictor 1 (to FID)	0.18 $\mu$ m ID ; 2.128 m
Restrictor 2 (to MSD)	0.18 $\mu$ m ID ; 2.886 m
Mode	Constant flow 1 mL/min
MSD Detector	Agilent MSD 5975 Inert
FID Temperature	300 °C
FID Detector flows	H <sub>2</sub> 30 mL/min, air 400 mL/min
Solvent delay-(MSD)	4.67 min
Scan-(MSD)	30-300 amu

# SAMPLE CHROMATOGRAMS



Total Ion Chromatogram (TIC, red trace) and chromatogram (FID, blue trace) for 125 ppm standard, 1  $\mu$ l single injection.  
1 Ethyl Isobutyrate; 2 2-Methyl Butyrate; 3 Deuterated Ethyl Butyrate (IS); 4 Ethyl Butyrate; 5 Myrcene; 6 Limonene, 7 cis-3-Hexenol ; 8 2-Nonanol (IS); 9 Linalool; 10 Menthol; 11 Ethyl Benzoate 12 Benzyl Alcohol; 13 Thymol; 14 Anisyl Alcohol; 15 Cinnamyl Alcohol, 16 3',4'-(Methylenedioxy)-acetophenone (IS)

# FUTURE WORK

- More method development of flavor chemicals

Borneol	cis/trans isoeugenol
1-decanol	cis-6-nonen-1-ol
1-dodecanol	1-nonanol
Geraniol	1-octanol
1-heptanol	2-octanol
1-hexanol	1-octen-3-ol

- May also be included in multi-lab validation
- Materials found in both Drawback and SDA products
- Stability of Flavor Chemicals

# FORMULAS ONLINE




# FORMULAS ONLINE

- ⦿ Online submission of Drawback and SDA formulas
- ⦿ Automatic calculations of eligible and total alcohol
- ⦿ Status tracking through system
  - In Progress
  - Needs Correction
  - Complete
- ⦿ Automatic notification of completed formula
- ⦿ Contact chemist assigned formula in system

# FORMULAS ONLINE

## ◎ Various formula types

- Simple Mixture
- Filtration
- Washed Extract
- Dietary Supplement
- Other - no automatic calculations



Alcohol Calculations  
Automatic

Paper Submission

### Summary ?

\* Measurements Used:

English  Metric

\* Process Type: ?

Simple Mixture ▼

Box #9

Box #10

	Low	High	UNIT	TOLERANCE
Eligible Absolute Alcohol Used:	<input type="text"/>	<input type="text"/>	% v/v <span>▼</span>	
Alcohol Content of Finished Product:	<input type="text"/>		% v/v <span>▼</span>	<input type="text"/>
Eligible Plus Recovered Spirits:	<input type="text"/>	<input type="text"/>	% v/v <span>▼</span>	

Is calculated alcohol content of finished product not the same as declared alcohol content?

\* Density of Finished Product:

\* Number of Days to Complete Process:

	WEIGHT (LB) (LOW)	WEIGHT (LB) (HIGH)	VOLUME (GAL) (LOW)	VOLUME (GAL) (HIGH)
Theoretical Yield:	<input type="text" value="0"/>		<input type="text" value="0"/>	
Actual Yield:	* <input type="text" value="100"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

### Alcoholic Beverage Use ?

Is Finished Product to be Used In Alcoholic Beverages?

Product Contains Natural Flavoring

Product Contains > 0.1% Artificial Flavoring *(excludes Vanillin, Ethyl Vanillin, Maltol, Ethyl Maltol)*

Product Contains Color Additive

All FDA Approved Ingredients Are Without Limitation

TTB LIMITED INGREDIENT	PARTS PER MILLION
Synthetic Vanillin:	<input type="text"/>
Ethyl Vanillin:	<input type="text"/>
Synthetic Maltol:	<input type="text"/>
Ethyl Maltol:	<input type="text"/>

### Alcoholic Components/Compounded Flavors (Simple Mix or Filtration) ?

Does product contain eligible alcohol?

#### ELIGIBLE ALCOHOL ?

<input type="checkbox"/>	INGREDIENT	WEIGHT (LB)	VOLUME (GAL)	DENSITY (LB/GAL)	ALCOHOL(%)
<input type="checkbox"/>	<a href="#">Ethanol 190 Proof</a>	54.2	7.98	6.8	95

Add

Delete

Does product contain disapproved intermediates?

Does product contain ineligible alcohol?

Box #13  
information

### Nonalcoholic Components ?

Does product contain ingredients by group?

Does product contain individual solid ingredients?

#### INDIVIDUAL INGREDIENTS (SOLIDS) ?

<input type="checkbox"/>	NATURAL/ARTIFICIAL NAME	FEMA #	ADDITIONAL INFORMATION	WEIGHT (LB)
<input type="checkbox"/>	Neither		<a href="#">Citric Acid</a>	6.5
<input type="checkbox"/>	Natural	2303	<a href="#">Citral</a>	0.6

Add

Delete

Does product contain individual liquid ingredients?

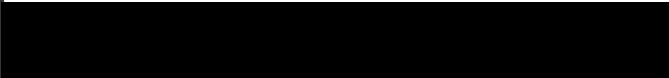
#### INDIVIDUAL INGREDIENTS (LIQUIDS) ?

<input type="checkbox"/>	NATURAL/ARTIFICIAL NAME	FEMA #	WEIGHT (LB)	VOLUME (GAL)	SOL	
<input type="checkbox"/>	Neither		<a href="#">Propylene Glycol</a>	22.3	2.58	<input type="checkbox"/>
<input type="checkbox"/>	Neither		<a href="#">Water</a>	16.4	1.97	<input type="checkbox"/>

Add

Delete

# FORMULAS ONLINE

- ◎ 1.0 release ('uniform' and user registration)
  - Winter 2011
- ◎ 1.1 release (drawback and SDA)
  - Summer 2011
- ◎ User Testing
  - Volunteers needed for external/submitter user testing
  - Winter/Spring 2011
  - Contact Rachel Sanderoff
    - 

QUESTIONS?