Flavor Unfitness Worksheet:

Using the following example:

6. NAME OF MANUFACTURER & ADDRESS WHERE PRODUCT WILL BE PRODUCED *(If multiple production sites, list other addresses in item 22.)* We Love Flavors 6000 Ammendale Rd Beltsville, MD 20705	7. CHECK KIND OF PRODUCT ☐ MEDICINE/MEDICINAL PREPARATION ☑ FLAVOR/FLAVORING EXTRACT ☐ FOOD PRODUCT ☐ PERFUME ☐ DIETARY SUPPLEMENT	8. FORMULAS SUPERSEDED
	9. ELIGIBLE ABSOLUTE ALCOHOL BY VOLUME USED *(See instructions)* 66.5 %	10. ALCOHOL CONTENT BY VOLUME OF FINISHED PRODUCT 66.6 +/- 2.5 %

11. IF MADE WITH RECOVERED SPIRITS ELIGIBLE PLUS RECOVERED ABSO-LUTE 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 01% ARTIFICIAL FLAVORING (Excluding Vanillin, Ethyl Vanillin, Maltol, and Ethyl Maltol)? (YES OR NO)_____
C. STATE PARTS PER MILLION IN PRODUCT OF: SYNTHETIC VANILLIN _____ ETHYL VANILLIN _____ SYNTHETIC MALTOL _____ ETHYL MALTOL_____
D. DOES PRODUCT CONTAIN ANY 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 in Box 22 if necessary)*

Alcohol 190 proof	60.88 lb	(8.96 gal)
Strawberry essence (3-4% alcohol)	2.90 lb	(0.36 gal)
Natural maltol	1.50 lb	
Ethyl butyrate (0.3 lb) and other nat esters	0.90 lb	
2-methyl butyric acid (0.1 lb) and other nat acids	0.70 lb	
Strawberry juice	1.75 lb	
Water	q.s.	
	100 lbs (12.80 gal)	

Simple Mixture

A. Fill in the formula information (name, TTB#, etc), total weight of the final product and alcohol content.
 • The alcohol content entered must be the high end of box #10.
 - *Example: 66.6 +/- 2.5% is entered as 69.1*

Flavor Unfitness Worksheet

Formula Information:	
Total Weight	100
Alcohol content (high end of box #10)	69.1

FEMA #	Ingredient	Weight of ingredient	ppm in flavor	ppm @ 15% ABV	MAX Use Level	Factor higher MAX Use Level	Fit or Unfit?	Remarks
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-
	-		-	-	-	-	-	-

B. Enter FEMA numbers in the appropriate column.
 • If needed, search for the FEMA number on the 'GRAS Materials' tab.

Flavor Unfitness Worksheet

	Formula Information:	
Total Weight	100	
Alcohol content (high end of box #10)	69	

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

FEMA #	Ingredient	Weight of ingredient	ppm in flavor	ppm @ 15% ABV	MAX Use Level	Factor higher MAX Use Level	Fit or Unfit?	Remarks
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-
		-	0.0	0.0	-	-	-	-

Flavor Ingredient Table | Component WS (lbs-gal) | Component WS (g-mL) | **GRAS Materials**

1773	97-96-1	2426	Butanal, 2-ethyl-	2-Ethylbutyraldehyde
1774	97-96-1	2426	Diethylacetaldehyde	2-Ethylbutyraldehyde
1775	97-96-1	2426	2-Ethylbutanal	2-Ethylbutyraldehyde
1776	97-96-1	2426	2-Ethylbutyraldehyde	
1777	105-54-4	2427	Butanoic acid, ethyl ester	Ethyl butyrate
1778	105-54-4	2427	Butyric ether	Ethyl butyrate
1779	105-54-4	2427	Ethyl n-butanoate	Ethyl butyrate
1780	105-54-4	2427	Ethyl butyrate	
1781	105-54-4	2427	Ethyl normal butanoate	Ethyl butyrate
1782	97-62-1	2428	Ethyl isobutyrate	
1783	97-62-1	2428	Ethyl 2-methylpropanoate	Ethyl isobutyrate
1784	97-62-1	2428	Propanoic acid, 2-methyl-, ethyl ester	Ethyl isobutyrate
1785	88-09-5	2429	Butanoic acid, 2-ethyl-	2-Ethylbutyric acid
1786	88-09-5	2429	Diethylacetic acid	2-Ethylbutyric acid
1787	88-09-5	2429	alpha-Ethylbutyric acid	2-Ethylbutyric acid
1788	88-09-5	2429	2-Ethylbutyric acid	
1789	103-36-6	2430	Ethyl cinnamate	
1790	103-36-6	2430	Ethyl phenylacrylate	Ethyl cinnamate
1791	103-36-6	2430	Ethyl 3-phenylpropenoate	Ethyl cinnamate
1792	103-36-6	2430	2-Propenoic acid, 3-phenyl-, ethyl ester	Ethyl cinnamate
1793	10094-36-7	2431	Cyclohexanepropanoic acid, ethyl ester	Ethyl cyclohexanepropionate
1794	10094-36-7	2431	Ethyl cyclohexanepropionate	
1795	10094-36-7	2431	Ethyl 3-cyclohexylpropanoate	Ethyl cyclohexanepropionate
1796	10094-36-7	2431	Ethyl cyclohexylpropionate	Ethyl cyclohexanepropionate

Note: For easier searching, use the ctrl-F or 'Find' function.

- Once the FEMA # is entered, the name of the ingredient and 'Max Use Level' will automatically fill in on the worksheet.

Flavor Unfitness Worksheet

Formula Information:	
Total Weight	100
Alcohol content (high end of box #10)	69.1

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		0.0	0.0	37.88	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-

C. Enter the weight of the ingredient.
   ** NOTE: The units of total weight and individual ingredients must match! **
- All calculations (ppm, max use level, etc) will be done automatically.
- If the amount of the ingredient (ppm) at 15% ABV is at least 5X the Max Use Level, then the final product is unfit.

Flavor Unfitness Worksheet

Formula Information:	
Total Weight	100
Alcohol content (high end of box #10)	69.1

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	0.3	3000.0	651.2	37.88	17.2	UNFIT	-
2695	2-METHYLBUTYRIC ACID	0.1	1000.0	217.1	3	72.4	UNFIT	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-

- "FIT (Max Use Level is higher)" appears in the Remarks column when the Max Use Level is higher than the ppm of the ingredient at 15% ABV.

FEMA #	Ingredient	Weight of ingredient	ppm in flavor	ppm @ 15% ABV	MAX Use Level	Factor higher MAX Use Level	Fit or Unfit?	Remarks
2127	BENZALDEHYDE	0.01	100.0	32.7	57.55	-	→	FIT (Max Use Level is higher)

D. Materials not applying to this guideline:
- These materials will not have a Max Use Level value, but instead will say "Removed."
  - Materials found in the "What Makes a Product Unfit?" section of the Drawback Tutorial. (ex: vanillin, triethyl citrate, etc.)
  - Materials found to be fit at 1% or 0.1%. (ex: isoamyl acetate, limonene, etc.)
  - 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?	Remarks
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	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-
-		0.0	0.0	-	-	-	-

Another Example using the Flavor Unfitness Worksheet:

	9. ELIGIBLE ABSOLUTE ALCOHOL VOLUME USED. *(See instructions)* **31.7%**	10. ALCOHOL CONTENT BY VOLUME OF FINISHED PRODUCT. **30.9 +/- 2.5%**

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)*.

Ethanol 190 proof	25.0 lbs (3.68 gal)
Propylene Glycol	31.7 lbs
Citric Acid	3 lbs
Raspberry Flavor (5% abv, disapproved #12)	8.9 lbs (1.1 gal)
Raspberry Essence (purchased 3% abv)	1 lb (.13 gal)
Natural Acetic Acid	0.3 lbs
Nat Ethyl Butyrate (0.04 lbs) and other natural esters	0.09 lbs
Nat trans-2-hexenal	0.01 lbs
Water	30 lbs
Theoretical Yield	100 lbs (11.5 gal)
Actual Yield	97 lbs (11.2 gal)

Filtration

Flavor Unfitness Worksheet

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

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	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-
	-		0.0	0.0	-	-	-	-

Component Worksheets:

The other tabs in this worksheet are based on the Guidelines in the "What Makes a Product Unfit?" section in the Drawback Tutorial (http://www.ttb.gov/ssd/drawbacktutorial.shtml#_Toc134863870). Based on the ethanol content of the flavor, this worksheet will calculate the amount needed of an ingredient, in the appropriate units, to make your product unfit.

	B102		f_x								
	A	B	C	D	E	F	G	H	I	J	K
1	Calculation Worksheets for Guidelines										
2	Units: pounds and gallons										
3											
4	**Anise Oil**	**4.43% by weight at 95% ethanol v/v**									
5		Alcohol Content (upper end of range in item 10)	Minimum Value Needed to Make Product Unfit		Amount of Anise Oil (pounds)	Weight of Final Product (pounds)	% by weight of Anise Oil	Unfit?			
6			0.000				-	-			
7											
8	**Black Pepper Powder**	**3.6 g/100 mL at 95% ethanol v/v**									
9		Alcohol Content (upper end of range in item 10)	Minimum Value Needed to Make Product Unfit		Amount of Black Pepper Powder (pounds)	Volume of Final Product (gallons)	g / 100 mL of Black Pepper Powder	Unfit?			
10			0.000				-	-			
11											
12	**Citric Acid**	**Ethanol ≤ 30% v/v – acid must be ≥ [(0.1 × ethanol %) + 0.5] (g/100 mL)**									
13		**Ethanol > 30% v/v – acid must be ≥ [0.1 × ethanol %] (g/100 mL)**									
14											
15		Alcohol Content (upper end of range in item 10)	Minimum Value Needed to Make Product Unfit		Amount of Citric Acid (pounds)	Volume of Final Product (gallons)	g / 100 mL of Citric Acid	Unfit?		Needed (if product contains mitigating ingredients)	Unfit?
16	Ethanol ≤ 30% v/v		0.500				-	-		1.000	-
17											
18		Alcohol Content (upper end of range in item 10)	Minimum Value Needed to Make Product Unfit		Amount of Citric Acid (pounds)	Volume of Final Product (gallons)	g / 100 mL of Citric Acid	Unfit?		Needed (if product contains mitigating ingredients)	Unfit?
19	Ethanol > 30% v/v		0.000				-	-		0.000	-

Flavor Ingredient Table | **Component WS (lbs-gal)** | Component WS (g-mL) | GRAS Materials

Ready