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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 27 1995

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Triadimefon. Grape Processing Study. Reregistration Case No. 2700.
Chemical No. 109901. MRID #43284401 DP Barcode D205423
CBRS #14186

FROM: Steven A. Knizner, Chemist *St. A. Knizner*
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Special Review and Reregistration Division (7508W)

The Triadimefon Phase 4 Review (1/24/91) required data depicting the magnitude of the residue of triadimefon and its regulated metabolites in/on grape processed fractions. In response, Miles Inc. submitted a grape processing study (MRID 42346701) that was reviewed by CBRS (S. Funk, CBRS No. 10114, DP Barcode D179962, 7/24/92). CBRS concluded that the study was adequate pending the submission of additional information/data. However, in a subsequent letter the registrant indicated that the submitted grape processing study may have been flawed because residues were detected in/on the RAC at lower levels than expected following applications at 5x rates. The registrant committed to conduct a new study, which has now been submitted (1994; MRID 43284401). These data have been reviewed by Dynamac Corp. under contract to the Agency and have undergone secondary review in CBRS to reflect Branch policies.

Tolerances for residues of triadimefon [1-(4-chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone] in/on raw agricultural commodities are expressed in terms of the combined residues of triadimefon and its metabolites containing chlorophenoxy and triazole moieties, expressed as triadimefon [40 CFR §180.410 (a) and (b)]. Food/feed additive tolerances are



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currently expressed in terms of the combined residues of triadimefon and its metabolite triadimenol [β -(4-chlorophenoxy)- α -(1,1-dimethylethyl)-1*H*-1,2,4-triazole-1-ethanol] [40 CFR §185.800 and 40 CFR §186.800].

A tolerance of 1 ppm has been established for the combined residues of triadimefon and its metabolites containing chlorophenoxy and triazole moieties, (expressed as parent) in/on grapes (40 CFR §180.410). The existing feed additive tolerances for the combined residues of triadimefon and its metabolite triadimenol in/on grape pomace (wet and dry) and raisin waste are 3 and 7 ppm, respectively (40 CFR §186.800). No food additive tolerances for processed commodities of grapes (grape juice and raisins) have been established.

Recommendations

The submitted grape processing study is adequate. CBRS concludes for the purposes of establishing food/feed additive tolerances, the combined residues of triadimefon and its related regulated compounds will concentrate 4x in raisins, 3x in wet pomace, 5x in dry pomace, and 7x in raisin waste during processing of grapes treated with triadimefon. There was no concentration of residues in grape juice.

Based on the existing tolerance of 1 ppm for residues of triadimefon and its related regulated compounds in/on grapes, the following recommendations can be made:

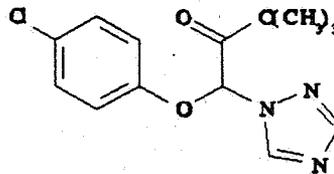
- Raisins - establish tolerance at 4 ppm [40 CFR §185.800]
- Pomace (wet and dry)- revoke tolerance for Pomace (wet and dry) at 3 ppm.
Establish tolerance for Pomace, wet at 3 ppm and Pomace, dried at 5 ppm [40 CFR §186.800].
- Raisin Waste - the existing tolerance of 7 ppm is appropriate [40 CFR §186.800].

These changes should be made in conjunction with the Triadimefon RED.

CBRS notes that Delaney considerations may preclude establishment and/or modification of food/feed additive tolerances.

cc: S.F., circ., R.F., List B File, S.Knizner, D.Hartman (PSPS, 7501C)
 RDI: A.Rathman, 2/16/95 M.Metzger, 2/21/95 F.Suhre, 2/23/95
 7509C:CBRS:CM#2:305-6903:SAK:sak:Tridime:2/15/95

TRIADIMEFON



Shaughnessy No. 109901; Case 2700

(CBRS No. 14186; DP Barcode D205423)

REGISTRANT'S RESPONSE TO RESIDUE CHEMISTRY DATA REQUIREMENTS

BACKGROUND

The Triadimefon Phase 4 review dated 1/24/91 required data depicting the magnitude of the residue of triadimefon and its regulated metabolites in/on grape processed fractions. In response, Miles Inc. (formerly Mobay Corporation) submitted a grape processing study (1992; MRID 42346701) that was reviewed by the Agency (S. Funk, CBRS No. 10114, DP Barcode D179962, 7/24/92). The Agency concluded that the study was adequate pending the submission of additional information/data. However, in a subsequent letter the registrant indicated that the submitted grape processing study may have been flawed because residues were detected in/on the RAC at lower levels than expected following applications at 5x rates. The registrant stated the intent to conduct a new study. Miles Inc. has submitted a new grape processing study (1994; MRID 43284401). These data are reviewed here for their adequacy in fulfilling residue chemistry data requirements.

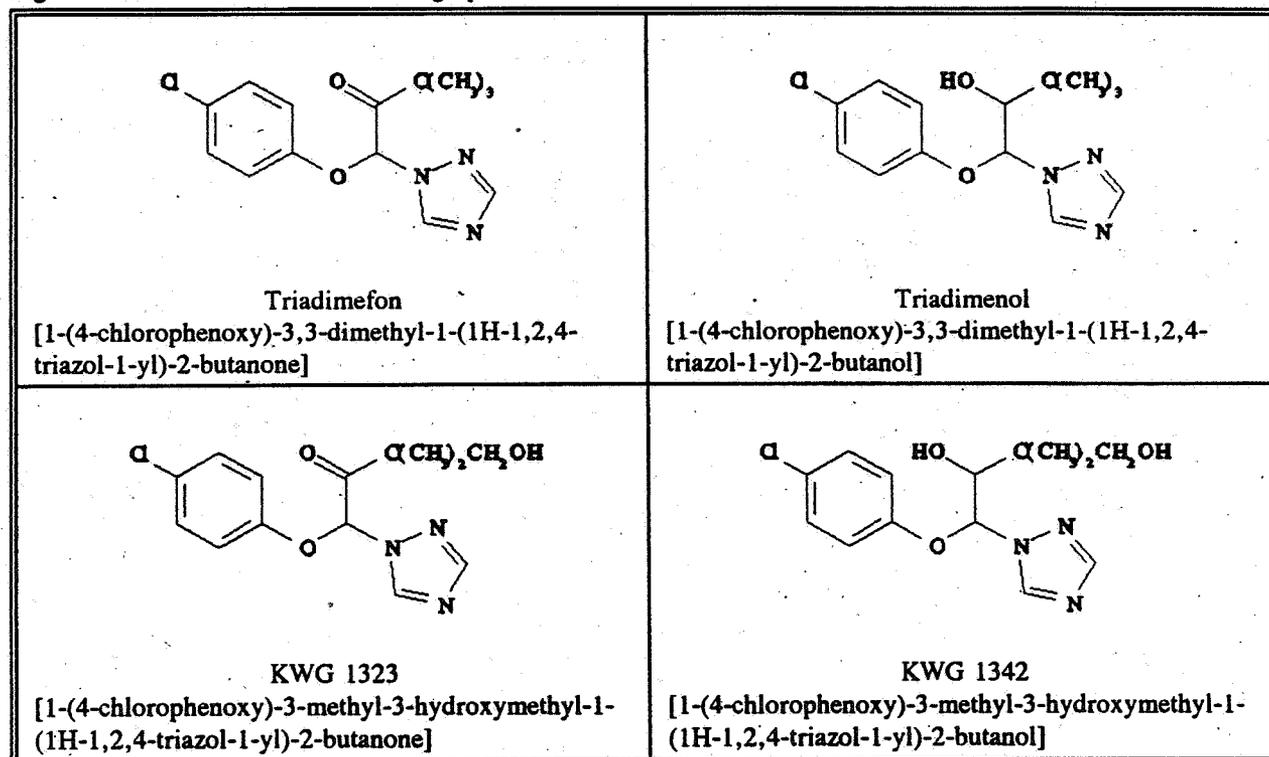
The qualitative nature of triadimefon residues in plants is adequately understood based on adequate cucumber, grape, tomato, and wheat metabolism studies. The HED Metabolism Committee concluded that triadimefon, triadimenol [1-(4-chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanol], KWG 1323 [1-(4-chlorophenoxy)-3-methyl-3-hydroxymethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone], and KWG 1342 [1-(4-chlorophenoxy)-3-methyl-3-hydroxymethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanol] are of toxicological concern in plants (Figure 1). In addition, the newly identified metabolite in wheat [1-(4-chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)ethanoic acid], designated KWG 01732 is also of toxicological concern only in wheat, barley, and grass. The qualitative nature of the residue in poultry and ruminants is not adequately understood; additional information/data are required from the existing animal metabolism studies.

Tolerances for residues of triadimefon [1-(4-chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone] in/on raw agricultural commodities are expressed in terms of the combined residues of triadimefon and its metabolites containing chlorophenoxy and triazole moieties, expressed as triadimefon [40 CFR §180.410 (a) and (b)]. Food/feed additive tolerances are currently expressed in terms of the combined residues of triadimefon and its metabolite

triadimenol [β -(4-chlorophenoxy)- α -(1,1-dimethylethyl)-1*H*-1,2,4-triazole-1-ethanol] [40 CFR §185.800 and 40 CFR §186.800].

A tolerance of 1 ppm has been established for the combined residues of triadimefon and its metabolites containing chlorophenoxy and triazole moieties, (expressed as parent) in/on grapes (40 CFR §180.410). The existing feed additive tolerances for the combined residues of triadimefon and its metabolite triadimenol in/on grape pomace (wet and dry) and raisin waste are 3 and 7 ppm, respectively (40 CFR §186.800).

Figure 1. Residues of concern in grapes.



PAM, Vol. II (Section 180.410) includes GC/MS Methods I and II for the enforcement of tolerances of triadimefon residues (triadimefon, triadimenol, KWG 1323, and KWG 1342) in/on animal tissues, milk, and eggs. The method is reportedly applicable to plants, but validation data are still required. An enforcement method capable of determining triadimefon, triadimenol, KWG 1323, KWG 1342, and KWG 1732 in/on wheat, barley, and grass is required.

Codex MRLs (CXL) are currently expressed in terms of the combined residues of triadimefon and triadimenol and have been established for grapes at 2 ppm. The Codex MRL level for grapes is not compatible with the U.S tolerance (1 ppm). In addition, compatibility cannot be achieved without modification of the U.S. tolerance definition.

Issues regarding harmonization of the Codex MRLs with the U.S. tolerances will be addressed when triadimefon reregistration eligibility decisions are made.

CONCLUSIONS

1. The grape processing study is adequate; residues of triadimefon and its three metabolites concentrated in raisins, raisin waste, wet pomace and dry pomace, but not grape juice.
 - 1.a. CBRS concludes for the purposes of establishing food/feed additive tolerances, the combined residues of triadimefon and its metabolites of concern will concentrate 4x in raisins, 3x in wet pomace, 5x in dry pomace, and 7x in raisin waste during processing of grapes treated with triadimefon.
 - 1.b. Based on the existing tolerance for triadimefon and regulated metabolites in/on grapes at 1 ppm the following tolerances are appropriate
 - Raisins - establish tolerance at 4 ppm [40 CFR §185.800]
 - Pomace (wet and dry)- revoke tolerance for Pomace (wet and dry) at 3 ppm. Establish tolerance for Pomace, wet at 3 ppm and Pomace, dried at 5 ppm [40 CFR §186.800].
 - Raisin Waste - the existing tolerance of 7 ppm is appropriate.
 - Grape juice - no food additive tolerance is required.
2. CBRS notes that Delaney considerations may preclude establishment and/or modification of food/feed additive tolerances.

DETAILED CONSIDERATIONS

Residue Analytical Methods

In conjunction with the grape processing study, Miles Inc. submitted a method description (1994; MRID 43284401) for the analysis of triadimefon residues in grapes and its processed fractions. Residues of triadimefon and its three metabolites, triadimenol, KWG 1342, and KWG 1323 were determined using the same GC/NPD method previously reviewed (S. Funk, CBRS No. 10114, DP barcode D179962, 7/24/92 and S. Knizner, CBRS Nos. 10087, 10030, and 10031 DP barcodes D179335, 181031, and 181032, 12/10/92) and deemed adequate for data collection on grapes and grape processed fractions.

Briefly, residues are extracted with MeOH:water (7:3,v/v), incubated with cellulase, partitioned into methylene chloride, cleaned up by gel permeation chromatography, and separated by semi-preparative HPLC into a fraction containing triadimefon and triadimenol and a second fraction containing KWG 1342 and KWG 1323. The KWG 1342 and KWG 1323 residues are derivatized with trifluoroacetic acid and trifluoroacetic anhydride to

produce trifluoroacyl derivatives. The residues are analyzed using GC/NPD in the nitrogen mode.

The registrant submitted method validation data previously reviewed by S. Funk (CBRS No. 10114). Control RAC, raisin, dry pomace, raisin waste, and juice samples were fortified at 0.05 and 0.1 ppm with each of the four analytes. Recoveries of the four analytes from the 40 samples analyzed were as follows: triadimefon, 76-114%; triadimenol, 78-140%; KWG 1342, 65-112%; and KWG 1323, 81-124%. The limit of quantitation (LOQ) for each analyte was 0.05 ppm. Concurrent recovery data from RAC and processed fraction control samples fortified with each analyte at 0.1-10 ppm were submitted (Table 1). Chromatograms, calculations, and raw data were presented. Residues of triadimefon and its metabolites were nondetectable (<0.05 ppm) in/on all control samples. Analyses were performed by ABC Laboratories in Columbia, MO.

Table 1. Concurrent method recoveries of triadimefon and its three metabolites from fortified control samples.

Commodity	Fortification Level (ppm)	% Recovery			
		Triadimefon	Triadimenol	KWG 1342	KWG 1323
RAC	0.1	79	107	71	82
	2	90	98	89, 79	81, 65
	10	78	77	NR*	NR
Juice	0.1	85, 77	82, 71	96, 66	95, 92
Wet Pomace	1	83	84	NR	NR
Dry Pomace	2	72	70	NR	NR
Raisins	1	90	98	97	89

* NR=none reported.

Magnitude of the Residue in Processed Food/Feeds

A REFs search dated 10/21/94 indicated that triadimefon formulated as a 50% WP (EPA Reg. Nos. 3125-320 and 3125-340) and a 2% FIC (EPA Reg. No. 3125-419) are currently registered for use on grapes. Current use directions specify foliar applications of the 50% WP formulations at up to 3 oz ai/A/application at 7-14 day intervals, up to a seasonal maximum of 9 oz ai/A. The 2% FIC formulation can be applied at up to 1.3 oz ai/A/application at 10-14 day intervals, up to a seasonal maximum of 9 oz ai/A. A 14-day PHI is specified.

Miles Inc. submitted (1994; MRID 43284401) data from 2 tests conducted in CA depicting the magnitude of residues of triadimefon and its metabolites, triadimenol, KWG 1342, and KWG 1323 in/on grapes and in processed grape commodities. Four foliar applications of the 50% DF formulation were made at 14 day intervals at a rate of 15 oz ai/A/application using a spray volume of 50 gal/A for a total seasonal application of 60 oz ai/A (6.7x). Mature fruit for processing were harvested in proportion to the fruit load of the vines and from

various parts of the vine (whole fruit samples). In addition, 30 samples (15 samples from each site) of the RAC were collected for analysis. The PHI was 14 days. Grape samples were delivered unfrozen on the day of harvest to the National Food Laboratory in Dublin, CA where they were refrigerated (~5-10 C) until processing. Two to three days later, processing was initiated using simulated commercial practices. Whole grapes and processed commodities (juice, wet and dry pomace, raisins, and raisin waste) were stored frozen (-10 C) for approximately a month prior to shipment to Miles, Inc. The sponsor stored the samples (-20 C) for 8 days prior to shipment to ABC Laboratories in Columbia, MO for analyses. According to the information provided analyses of all processed fractions were begun within 5 months of production. The registrant stated that overall, grape RAC and processed fractions were held in frozen storage (-20 C) for up to 230 days (approximately 8 months).

Previously reviewed storage stability data (S. Hummel, CBRS Nos. 8566 and 9929, DP Barcodes D168542 and D178884, 12/22/92 and S. Knizner, CBRS No. 12528, DP Barcode D194783, 11/17/93) indicated that residues of triadimefon and its metabolites, triadimenol, KWG 1342, and KWG 1323 are stable in/on grape samples stored at approximately -20 C for up to 24 months (749 days), in juice, and wet and dry pomace for up to 6 months (186 days), and in raisins for up to 12 months (354 days). CBRS concludes that the storage stability data adequately supports the submitted processing. No additional storage stability data are required.

Thirty treated RAC samples (15 from each test site), two (one from each test site) each of the treated whole fruit, raisin, wet pomace, dry pomace, raisin waste, and juice samples, and two to four control samples of each matrix were analyzed for triadimefon residues using the method described in the Residue Analytical Methods section above. Residues of each analyte were non-detectable (<0.05 ppm; LOQ) in the 14 control samples. Residues of triadimefon and its metabolites in treated grape RAC and processed commodities are presented in Table 2. A detailed summary (in LOTUS 1-2-3 spreadsheet) of the residue data is included with this document as Attachment 1.

In summary, the grape processing study is adequate; residues of triadimefon and its three metabolites concentrated in raisins, raisin waste, and pomace (wet and dry) but not grape juice. CBRS concludes for the purposes of establishing food/feed additive tolerances, if appropriate, the combined residues of triadimefon and its metabolites will concentrate 4x in raisins, 3x in wet pomace, 5x in dry pomace, and 7x in raisin waste during processing of grapes treated with triadimefon. As there was no concentration in grape juice, no food additive tolerance for juice is required.

Table 2. Residues of triadimefon and its three metabolites found in/on grape and grape processed fractions.

Commodity	Trial CA-1		Trial CA-2	
	Total Residue (ppm)	Concentration Factor	Total Residue (ppm)	Concentration Factor
Grapes	0.69	--	0.21	--
Raisins	0.46	0.7	0.95	4.5
Raisin Waste	1.49	2.2	1.57	7.5
Wet Pomace	1.96	2.8	0.58	2.8
Dry Pomace	4.05	5.9	0.80	3.8
Juice	0.23	--	0.20†	--

† Total residue - sum of triadimefon, triadimenol, KWG 1342 and KWG 1323.

MASTER RECORD IDENTIFICATION NUMBERS

The citations for the MRID documents referred to in this review are presented below:

42346701 Burger, R. (1992) Triadimefon (50DF)-Magnitude of the Residue on Processed Grape Commodities: Lab Project Number: BL19GR02:39587: RP 5522. Unpublished study prepared by Miles Inc., ABC Laboratories, Inc. and The National Food Laboratory Inc. 277p.

42857401 Williams, B. and Chickering, C. (1993) Triadimefon and Metabolites-Freezer Storage Stability Study in Raw Agricultural Commodities and Processed Products Agricultural Commodities and Processed Products: Lab Project Number: 396832: BL131601: 102641-1. Unpublished study prepared by ABC Labs, Inc. 150 p.

43284401 Burger, R.N. (1994): Triadimefon (50DF)-Magnitude of the Residue in Processed Grape Commodities. Miles ID No. BL19GR03. Unpublished study conducted by ABC Laboratories, Inc. for Miles, Inc. 648 pp.

AGENCY MEMORANDA

CBRS No.: 10114
 DP Barcode: D179962
 Subject: FIFRA 6(a)(2) Data and Reregistration of Triadimefon. Processing Studies for Apples and Grapes.
 From: S. Funk, CBRS
 To: M. Wilhite, SRRD

Dated: 7/24/92
MRID(s) 42346601 and 42346701

CBRS No.: CBRS Nos. 10087, 10030, and 10031
DP Barcode: D179335, D181031, and D181032
Subject: Magnitude of the residue studies for apples, pears, cucumbers, summer squash, cantaloupes, grapes, and pineapples.

From: S. Knizner, CBRS
To: M. Wilhite/B. Sidwell, SRRD
Dated: 12/10/92
MRID(s) 41809401 and 42342303 through -08

CBRS No.: CBRS Nos. 8566 and 9929
DP Barcode: D168542 and D178884
Subject: Triadimefon: Storage Stability Data, PAM I Multiresidue Methods, and Product Chemistry Data

From: S. Hummel, CBRS
To: M. Wilhite/B. Sidwell, SRRD
Dated: 12/22/92
MRID(s) 41976601 and -02, 42307801 to -03

CBRS No.: CBRS No. 12528
DP Barcode: D194783
Subject: Triadimefon: Storage Stability Data
From: S. Knizner, CBRS
To: M. Wilhite, SRRD
Dated: 11/17/93
MRID(s) 42857401

Formulation: 50% DF

Triadimefon Residues in Grapes Processed Commodities: Magnitude of the Residue Study (MRID 43284401)

Number of Samples	Year	Location	Crop	Commodity	Equip.	Application			PTI (days)	Residues (ppm)			Fortification			Storage Interval (months)	Temp. (C)			
						Rate (oz ai/A)	Number	Total rate (oz ai/A)		Triadimefon	Triadimenol	KWG 1342	KWG 1323	Total	Triadimefon			Triadimenol	KWG 1342	KWG 1323
1	1983	CA-1	grapes	fruit	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	<0.20	79	107	71	82	8	-20	
1	1983	CA-1	grapes	fruit	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	<0.20	90	98	89	81	8	-20	
1	1983	CA-2	grapes	fruit	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	<0.20	78	77	79	65	8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.19	0.25	<0.05	0.55					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.23	0.31	<0.05	0.64					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.24	0.27	<0.05	0.61					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.17	0.23	<0.05	0.50					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.16	0.24	<0.05	0.50					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.28	0.28	<0.05	0.66					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.17	0.22	<0.05	0.49					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.30	0.29	<0.05	0.69					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.28	0.33	<0.05	0.71					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.26	0.24	<0.05	0.54					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.24	0.33	<0.05	0.67					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.27	0.43	<0.05	0.80					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.26	0.36	<0.05	0.72					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.28	0.46	<0.05	0.84					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.28	0.33	<0.05	0.69					8	-20	
1	1983	CA-1	grapes	fruit (p)	50	15	4	60	14	0.21	0.39	<0.05	0.70					8	-20	
1	1983	CA-1	grapes	fruit	50	15	4	60	14	0.05	0.14	<0.05	0.36					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	0.22*	0.19*	<0.05*	0.51					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	0.05	0.25	<0.05	0.40					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	0.12	0.44	<0.05	0.66					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	<0.05	0.07	<0.05	0.22					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	0.05	0.10	<0.05	0.25					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	<0.05	0.08	<0.05	0.23					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	<0.05	0.16	<0.05	0.31					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	0.06	0.16	<0.05	0.32					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	0.05	0.09	<0.05	0.24					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	0.10	0.15	<0.05	0.35					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	0.07	0.16	<0.05	0.33					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	<0.05	0.08	<0.05	0.23					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	<0.05	0.09	<0.05	0.24					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	0.07	0.10	<0.05	0.27					8	-20	
1	1983	CA-2	grapes	fruit	50	15	4	60	14	<0.05	0.08	<0.05	0.21					8	-20	
1	1983	CA-2	grapes	fruit (p)	50	15	4	60	14	<0.05	<0.05	<0.05	0.20	90	98	97	89	8	-20	
1	1983	CA-2	grapes	raisin	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	0.20					8	-20	
1	1983	CA-2	grapes	raisin	N/A	N/A	N/A	N/A	N/A	<0.05	0.26	<0.05	0.46					8	-20	
1	1983	CA-1	grapes	raisin waste	N/A	N/A	N/A	N/A	N/A	0.15*	0.54*	<0.05*	0.95					8	-20	
1	1983	CA-2	grapes	raisin waste	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	0.20					8	-20	
1	1983	CA-1	grapes	raisin waste	50	15	4	60	14	0.83	0.42	<0.05	1.49					8	-20	
1	1983	CA-2	grapes	raisin waste	50	15	4	60	14	0.86	0.30	0.11	1.57					8	-20	
1	1983	CA-1	grapes	juice	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	0.20					5	-20	
1	1983	CA-2	grapes	juice	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	0.20					5	-20	
1	1983	CA-2	grapes	juice	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	0.23					5	-20	
1	1983	CA-1	grapes	juice	50	15	4	60	14	0.05	0.08	<0.05	0.20					5	-20	
1	1983	CA-2	grapes	juice	50	15	4	60	14	<0.05	<0.05	<0.05	0.20					5	-20	
1	1983	CA-1	grapes	wet pomace	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	0.20					5	-20	
1	1983	CA-2	grapes	wet pomace	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	0.20					5	-20	
1	1983	CA-1	grapes	wet pomace	50	15	4	60	14	0.98*	0.05	<0.05	1.96					8	-20	
1	1983	CA-2	grapes	wet pomace	50	15	4	60	14	0.17	0.31	<0.05	0.58					8	-20	
1	1983	CA-1	grapes	dry pomace	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	0.20					8	-20	
1	1983	CA-2	grapes	dry pomace	N/A	N/A	N/A	N/A	N/A	<0.05	<0.05	<0.05	0.20					8	-20	
1	1983	CA-1	grapes	dry pomace	50	15	4	60	14	1.99*	1.91*	<0.05	4.05					8	-20	
1	1983	CA-2	grapes	dry pomace	50	15	4	60	14	0.23	0.47	<0.05	0.80					8	-20	

(P) = Subsample from composite used for processing.

* = Average of three analyses.

NR = Not reported.

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