

SECTION 4

RISK-BASED CONSUMPTION LIMIT TABLES

4.1 OVERVIEW AND SECTION ORGANIZATION

This section provides consumption limit tables for carcinogenic and chronic health endpoints for the general adult population for all of the target analytes listed in Table 1-1.

Variables used to calculate the consumption limits include fish meal size, consumer body weight, contaminant concentration in the fish tissue, the time-averaging period selected (monthly), the reference dose for noncarcinogenic health endpoints, and the cancer potency factor and the maximum acceptable risk level for carcinogenic health endpoints. Default values for the variables are presented in Section 3 and described in greater detail in Section 2.

Each consumption table lists, by chemical, the maximum number of fish meals per unit time (monthly) that may be safely eaten. Readers may use these tables by: determining the chemical contaminant concentration in fish surveyed in local fish sampling and analysis programs and reading the value for the maximum number of meals per month that may be safely eaten for each contaminant for noncancer and cancer endpoints. For those contaminants with monthly fish consumption limits calculated for both the noncancer and cancer endpoints, EPA recommends using the more conservative of the two values. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.

Some of the contaminant concentrations shown in the consumption limit tables are below current laboratory detection limits. Because of improvements in chemical analysis procedures and associated technologies, however, chemical detection limits regularly decrease. The fish tissue concentrations that are currently below the limit of detection are provided so that risk managers may use them once lower detection limits are achievable through improvements in analytical procedures. **Note:** The reader should be aware that detection limits presented here are derived from state-of-the-art state, regional, and national fish monitoring programs and may not be representative of detection limits achievable in all laboratories. Readers should consult with the analytical chemists in their state responsible for analyzing fish tissue samples to ensure that their detection limits are comparable to those presented. If the detection limits presented are lower than those achieved in the state's program, the reader should make

necessary adjustments to the tables. The detection limits presented here are to provide general guidance on detection limits typically achievable using current analytical procedures. The reader should review Section 6 of Volume 1 for further information on chemical analysis procedures and associated detection and quantitation limits for the target analytes.

4.2 CONSUMPTION LIMIT TABLES

Tables 4-1 through 4-25 are consumption limit tables for carcinogenic and chronic systemic health endpoints for each of the target analytes. Readers using the tables as a basis for fish consumption advisories should note that the values given in the tables are valid **only** for single contaminants in single-species diets. Sections 3.4 and 3.5 describe methods for calculating consumption limits for multiple contaminant situations and for multiple fish species diets.

Table 4-1. Monthly Fish Consumption Limits for Carcinogenic and Noncarcinogenic Health Endpoints - Arsenic (inorganic)

Risk Based Consumption Limit ^a	Noncancer Health Endpoints ^b	Cancer Health Endpoints ^c
Fish Meals/Month	Fish Tissue Concentrations, (ppm, wet weight)	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.088	0 - 0.002
16	>0.088 - 0.18	>0.002 - 0.0039
12	>0.18 - 0.23	>0.0039 - 0.0052
8	>0.23 - 0.35	>0.0052 - 0.0078
4	>0.35 - 0.7	>0.0078 - 0.016
3	>0.7 - 0.94	>0.016 - 0.021
2	>0.94 - 1.4	>0.021 - 0.031
1	>1.4 - 2.8	>0.031 - 0.063
0.5	>2.8 - 5.6	>0.063 - 0.13
None (<0.5)	>5.6	>0.13

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Notes:

- Consumption limits are based on an adult body weight of 70 kg, an RfD of 3×10^{-4} mg/kg-d, and a cancer slope factor (CSF) of $1.5 \text{ (mg/kg-d)}^{-1}$.
- None = No consumption recommended.
- In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
- The detection limit for arsenic is 5×10^{-3} mg/kg.
- Instructions for modifying the variables in this table are found in Section 3.3.
- Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-2. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Cadmium

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.088
16	>0.088 - 0.18
12	>0.18 - 0.23
8	>0.23 - 0.35
4	>0.35 - 0.7
3	>0.7 - 0.94
2	>0.94 - 1.4
1	>1.4 - 2.8
0.5	>2.8 - 5.6
None (<0.5)	>5.6

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and an RfD of 1×10^{-3} mg/kg-d.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for cadmium is 5×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-3. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Methylmercury

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.029
16	>0.029 - 0.059
12	>0.059 - 0.078
8	>0.078 - 0.12
4	>0.12 - 0.23
3	>0.23 - 0.31
2	>0.31 - 0.47
1	>0.47 - 0.94
0.5	>0.94 - 1.9
None (<0.5)	>1.9

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and an interim RfD of 1×10^{-4} mg/kg-d.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for methylmercury is 1×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-4. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Selenium

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 1.5
16	>1.5 - 2.9
12	>2.9 - 3.9
8	>3.9 - 5.9
4	>5.9 - 12
3	>12 - 16
2	>16 - 23
1	>23 - 47
0.5	>47 - 94
None (<0.5)	>94

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and an RfD of 5×10^{-3} mg/kg-d.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for selenium is 17×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-5. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Tributyltin

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.088
16	>0.088 - 0.18
12	>0.18 - 0.23
8	>0.23 - 0.35
4	>0.35 - 0.7
3	>0.7 - 0.94
2	>0.94 - 1.4
1	>1.4 - 2.8
0.5	>2.8 - 5.6
None (<0.5)	>5.6

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and an RfD of 3×10^{-4} mg/kg-d.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for tributyltin is 2×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-6. Monthly Fish Consumption Limits for Carcinogenic and Noncarcinogenic Health Endpoints - Chlordane

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b	Cancer Health Endpoints^c
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.15	0 - 0.0084
16	>0.15 - 0.29	>0.0084 - 0.017
12	>0.29 - 0.39	>0.017 - 0.022
8	>0.39 - 0.59	>0.022 - 0.034
4	>0.59 - 1.2	>0.034 - 0.067
3	>1.2 - 1.6	>0.067 - 0.089
2	>1.6 - 2.3	>0.089 - 0.13
1	>2.3 - 4.7	>0.13 - 0.27
0.5	>4.7 - 9.4	>0.27 - 0.54
None (<0.5)	>9.4	>0.54

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg, an RfD of 5×10^{-4} mg/kg-d, and a cancer slope factor (CSF) of $0.35 \text{ (mg/kg-d)}^{-1}$.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for chlordane is 1×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-7. Monthly Fish Consumption Limits for Carcinogenic and Noncarcinogenic Health Endpoints - DDT

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b	Cancer Health Endpoints^c
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.015	0 - 0.0086
16	>0.015 - 0.029	>0.0086 - 0.017
12	>0.029 - 0.039	>0.017 - 0.023
8	>0.039 - 0.059	>0.023 - 0.035
4	>0.059 - 0.12	>0.035 - 0.069
3	>0.12 - 0.16	>0.069 - 0.092
2	>0.16 - 0.23	>0.092 - 0.14
1	>0.23 - 0.47	>0.14 - 0.28
0.5	>0.47 - 0.94	>0.28 - 0.55
None (<0.5)	>0.94	>0.55

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Notes:

- Consumption limits are based on an adult body weight of 70 kg, an RfD of 5×10^{-4} mg/kg-d, and a cancer slope factor (CSF) of $0.34 \text{ (mg/kg-d)}^{-1}$.
- None = No consumption recommended.
- In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
- The detection limit for DDT is 1×10^{-4} mg/kg.
- Instructions for modifying the variables in this table are found in Section 3.3.
- Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-8. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Dicofol

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.088
16	>0.088 - 0.18
12	>0.18 - 0.23
8	>0.23 - 0.35
4	>0.35 - 0.7
3	>0.7 - 0.94
2	>0.94 - 1.4
1	>1.4 - 2.8
0.5	>2.8 - 5.6
None (<0.5)	>5.6

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and an RfD of 4×10^{-4} mg/kg-d.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for dicofol is 1×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-9. Monthly Fish Consumption Limits for Carcinogenic and Noncarcinogenic Health Endpoints - Dieldrin

Risk Based Consumption Limit ^a	Noncancer Health Endpoints ^b	Cancer Health Endpoints ^c
Fish Meals/Month	Fish Tissue Concentration (ppm, wet weight)	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.015	0 - 0.00018
16	>0.015 - 0.029	>0.00018 - 0.00037
12	>0.029 - 0.039	>0.00037 - 0.00049
8	>0.039 - 0.059	>0.00049 - 0.00073
4	>0.059 - 0.12	>0.00073 - 0.0015
3	>0.12 - 0.16	>0.0015 - 0.002
2	>0.16 - 0.23	>0.002 - 0.0029
1	>0.23 - 0.47	>0.0029 - 0.0059
0.5	>0.47 - 0.94	>0.0059 - 0.012
None (<0.5)	>0.94	>0.012

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg, an RfD of 5×10^{-5} mg/kg-d, and a cancer slope factor (CSF) of $16 \text{ (mg/kg-d)}^{-1}$.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for dieldrin is 1×10^{-4} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-10. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Endosulfan

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 1.8
16	>1.8 - 3.5
12	>3.5 - 4.7
8	>4.7 - 7
4	>7 - 14
3	>14 - 19
2	>19 - 28
1	>28 - 56
0.5	>56 - 110
None (<0.5)	>110

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and an RfD of 6×10^{-3} mg/kg-d.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for endosulfan is 5×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-11. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Endrin

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.088
16	>0.088 - 0.18
12	>0.18 - 0.23
8	>0.23 - 0.35
4	>0.35 - 0.7
3	>0.7 - 0.94
2	>0.94 - 1.4
1	>1.4 - 2.8
0.5	>2.8 - 5.6
None (<0.5)	>5.6

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Notes:

- Consumption limits are based on an adult body weight of 70 kg and an RfD of 3×10^{-4} mg/kg-d.
- None = No consumption recommended.
- In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
- The detection limit for endrin is 1×10^{-4} mg/kg.
- Instructions for modifying the variables in this table are found in Section 3.3.
- Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-12. Monthly Fish Consumption Limits for Carcinogenic and Noncarcinogenic Health Endpoints - Heptachlor Epoxide

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b	Cancer Health Endpoints^c
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.0038	0 - 0.00032
16	>0.0038 - 0.0076	>0.00032 - 0.00064
12	>0.0076 - 0.01	>0.00064 - 0.00086
8	>0.01 - 0.015	>0.00086 - 0.0013
4	>0.015 - 0.031	>0.0013 - 0.0026
3	>0.031 - 0.041	>0.0026 - 0.0034
2	>0.041 - 0.061	>0.0034 - 0.0052
1	>0.061 - 0.12	>0.0052 - 0.01
0.5	>0.12 - 0.24	>0.01 - 0.021
None (<0.5)	>0.24	>0.021

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Notes:

- Consumption limits are based on an adult body weight of 70 kg, an RfD of 1.3×10^{-5} mg/kg-d, and a cancer slope factor (CSF) of $9.1 \text{ (mg/kg-d)}^{-1}$.
- None = No consumption recommended.
- In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
- The detection limit for heptachlor epoxide is 1×10^{-4} mg/kg.
- Instructions for modifying the variables in this table are found in Section 3.3.
- Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-13. Monthly Fish Consumption Limits for Carcinogenic and Noncarcinogenic Health Endpoints - Hexachlorobenzene

Risk Based Consumption Limit ^a	Noncancer Health Endpoints ^b	Cancer Health Endpoints ^c
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.23	0 - 0.0018
16	>0.23 - 0.47	>0.0018 - 0.0037
12	>0.47 - 0.63	>0.0037 - 0.0049
8	>0.63 - 0.94	>0.0049 - 0.0073
4	>0.94 - 1.9	>0.0073 - 0.015
3	>1.9 - 2.5	>0.015 - 0.02
2	>2.5 - 3.8	>0.02 - 0.029
1	>3.8 - 7.5	>0.029 - 0.059
0.5	>7.5 - 15	>0.059 - 0.12
None (<0.5)	>15	>0.12

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Note:

- Consumption limits are based on an adult body weight of 70 kg, an RfD of 8×10^{-4} mg/kg-d, and a cancer slope factor (CSF) of 1.6 (mg/kg-d)⁻¹.
- None = No consumption recommended.
- In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
- The detection limit for hexachlorobenzene is 1×10^{-4} mg/kg.
- Instructions for modifying the variables in this table are found in Section 3.3.
- Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

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Table 4-14. Monthly Fish Consumption Limits for Carcinogenic and Noncarcinogenic Health Endpoints - Lindane

Risk Based Consumption Limit ^a	Noncancer Health Endpoints ^b	Cancer Health Endpoints ^c
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.088	0 - 0.0023
16	>0.088 - 0.18	>0.0023 - 0.0045
12	>0.18 - 0.23	>0.0045 - 0.006
8	>0.23 - 0.35	>0.006 - 0.009
4	>0.35 - 0.7	>0.009 - 0.018
3	>0.7 - 0.94	>0.018 - 0.024
2	>0.94 - 1.4	>0.024 - 0.036
1	>1.4 - 2.8	>0.036 - 0.072
0.5	>2.8 - 5.6	>0.072 - 0.14
None (<0.5)	>5.6	>0.14

^a The assumed meal size is 8 oz (0.227 kg). A range of chemical concentrations are presented that are conservative, e.g. the 12 meal per month levels represent the concentrations associated with 12 meals up to 15.9 meals.

^b Chronic, systemic effects.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg, an RfD of 3×10^{-4} mg/kg-d, and a cancer slope factor (CSF) of $1.3 \text{ (mg/kg-d)}^{-1}$
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for lindane is 1×10^{-4} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-15. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Mirex

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.059
16	>0.059 - 0.12
12	>0.12 - 0.16
8	>0.16 - 0.23
4	>0.23 - 0.47
3	>0.47 - 0.63
2	>0.63 - 0.94
1	>0.94 - 1.9
0.5	>1.9 - 3.8
None (<0.5)	>3.8

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and RfD of 2×10^{-4} mg/kg-d
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for mirex is 1×10^{-4} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-16. Monthly Fish Consumption Limits for Carcinogenic and Noncarcinogenic Health Endpoints - Toxaphene

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b	Cancer Health Endpoints^c
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.073	0 - 0.0027
16	>0.073 - 0.15	>0.0027 - 0.0053
12	>0.15 - 0.2	>0.0053 - 0.0071
8	>0.2 - 0.29	>0.0071 - 0.011
4	>0.29 - 0.59	>0.011 - 0.021
3	>0.59 - 0.78	>0.021 - 0.028
2	>0.78 - 1.2	>0.028 - 0.043
1	>1.2 - 2.3	>0.043 - 0.085
0.5	>2.3 - 4.7	>0.085 - 0.17
None (<0.5)	>4.7	>0.17

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Notes:

- Consumption limits are based on an adult body weight of 70 kg, an RfD of 2.5×10^{-4} mg/kg-d, and a cancer slope factor (CSF) of $1.1 \text{ (mg/kg-d)}^{-1}$.
- None = No consumption recommended.
- In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
- The detection limit for toxaphene is 3×10^{-3} mg/kg.
- Instructions for modifying the variables in this table are found in Section 3.3.
- Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-17. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Chlorpyrifos

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.088
16	>0.088 - 0.18
12	>0.18 - 0.23
8	>0.23 - 0.35
4	>0.35 - 0.7
3	>0.7 - 0.94
2	>0.94 - 1.4
1	>1.4 - 2.8
0.5	>2.8 - 5.6
None (<0.5)	>5.6

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and an RfD of 3×10^{-4} mg/kg-d.*
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for chlorpyrifos is 2×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

* Because of the potential for adverse neurological development effects, EPA recommends the use of a Population Adjusted Dose (PAD) of 3×10^{-5} mg/kg-d for infants, children to age six, and women aged 13-50.

Table 4-18. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Diazinon

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.21
16	>0.21 - 0.41
12	>0.41 - 0.55
8	>0.55 - 0.82
4	>0.82 - 1.6
3	>1.6 - 2.2
2	>2.2 - 3.3
1	>3.3 - 6.6
0.5	>6.6 - 13
None (<0.5)	>13

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and an RfD of 7×10^{-4} mg/kg-d.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for diazinon is 2×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-19. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Disulfoton

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.012
16	>0.012 - 0.023
12	>0.023 - 0.031
8	>0.031 - 0.047
4	>0.047 - 0.094
3	>0.094 - 0.13
2	>0.13 - 0.19
1	>0.19 - 0.38
0.5	>0.38 - 0.75
None (<0.5)	>0.75

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and an RfD of 4×10^{-5} mg/kg-d.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for disulfoton is 2×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-20. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Ethion

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.15
16	>0.15 - 0.29
12	>0.29 - 0.39
8	>0.39 - 0.59
4	>0.59 - 1.2
3	>1.2 - 1.6
2	>1.6 - 2.3
1	>2.3 - 4.7
0.5	>4.7 - 9.4
None (<0.5)	>9.4

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and an RfD of 5×10^{-4} mg/kg-d.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for ethion is 2×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-21. Monthly Fish Consumption Limits for Noncarcinogenic Health Endpoint - Terbufos

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.0059
16	>0.0059 - 0.012
12	>0.012 - 0.016
8	>0.016 - 0.023
4	>0.023 - 0.047
3	>0.047 - 0.063
2	>0.063 - 0.094
1	>0.094 - 0.19
0.5	>0.19 - 0.38
None (<0.5)	>0.38

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and an RfD of 2×10^{-5} mg/kg-d.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for terbufos is 2×10^{-3} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-22. Monthly Fish Consumption Limits for Carcinogenic and Noncarcinogenic Health Endpoints - Oxyfluorfen

Risk Based Consumption Limit ^a	Noncancer Health Endpoints ^b	Cancer Health Endpoints ^c
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.88	0 - 0.04
16	>0.88 - 1.8	>0.04 - 0.08
12	>1.8 - 2.3	>0.08 - 0.11
8	>2.3 - 3.5	>0.11 - 0.16
4	>3.5 - 7	>0.16 - 0.32
3	>7 - 9.4	>0.32 - 0.43
2	>9.4 - 14	>0.43 - 0.64
1	>14 - 28	>0.64 - 1.3
0.5	>28 - 56	>1.3 - 2.6
None (<0.5)	>56	>2.6

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Noted:

1. Consumption limits are based on an adult body weight of 70 kg, an RfD of 3×10^{-3} mg/kg-d, and a cancer slope factor (CSF) of $0.0732 \text{ (mg/kg-d)}^{-1}$.
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for oxyfluorfen is 1×10^{-2} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-23. Monthly Fish Consumption Limits for Carcinogenic Health Endpoint - PAHs

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b	Cancer Health Endpoints^c
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	NA	0 - 0.0004
16	NA	>0.0004 - 0.0008
12	NA	>0.0008 - 0.0011
8	NA	>0.0011 - 0.0016
4	NA	>0.0016 - 0.0032
3	NA	>0.0032 - 0.0043
2	NA	>0.0043 - 0.0064
1	NA	>0.0064 - 0.013
0.5	NA	>0.013 - 0.026
None (<0.5)	NA	>0.026

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects. An RfD is not available (NA) for this compound.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

Notes:

1. Consumption limits are based on an adult body weight of 70 kg and a cancer slope factor (CSF) of 7.3 (mg/kg-d)⁻¹. No RfD was available (June 1999).
2. None = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for PAHs is 1×10^{-6} mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

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Table 4-24. Monthly Fish Consumption Limits for Carcinogenic and Noncarcinogenic Health Endpoints - PCBs

Risk Based Consumption Limit ^a	Noncancer Health Endpoints ^b	Cancer Health Endpoints ^c
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)	Fish Tissue Concentrations (ppm, wet weight)
Unrestricted (>16)	0 - 0.0059	0 - 0.0015
16	>0.0059 - 0.012	>0.0015 - 0.0029
12	>0.012 - 0.016	>0.0029 - 0.0039
8	>0.016 - 0.023	>0.0039 - 0.0059
4	>0.023 - 0.047	>0.0059 - 0.012
3	>0.047 - 0.063	>0.012 - 0.016
2	>0.063 - 0.094	>0.016 - 0.023
1	>0.094 - 0.19	>0.023 - 0.047
0.5	>0.19 - 0.38	>0.047 - 0.094
None (<0.5)	>0.38	>0.094

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

* Concentration reported in parts per quadrillion (nanogram per kg or 10⁻⁹ g/kg).

Notes:

1. Consumption limits are based on an adult body weight of 70 kg, and RfD of 2x10⁻⁵, and a cancer slope factor (CSF) of 2 (mg/kg-d)⁻¹.
2. NONE = No consumption recommended.
3. In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
4. The detection limit for PCBs (sum of Aroclors) is 2 x 10⁻² mg/kg.
5. Instructions for modifying the variables in this table are found in Section 3.3.
6. Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).

Table 4-25. Monthly Fish Consumption Limits for Carcinogenic Health Endpoint - Dioxins/Furans

Risk Based Consumption Limit^a	Noncancer Health Endpoints^b	Cancer Health Endpoints^c
Fish Meals/Month	Fish Tissue Concentrations (ppm, wet weight)	Fish Tissue Concentrations (ppt*-TEQ, wet weight)
Unrestricted (>16)	NA	0 - 0.019
16	NA	>0.019 - 0.038
12	NA	>0.038 - 0.05
8	NA	>0.05 - 0.075
4	NA	>0.075 - 0.15
3	NA	>0.15 - 0.2
2	NA	>0.2 - 0.3
1	NA	>0.3 - 0.6
0.5	NA	>0.6 - 1.2
None (<0.5)	NA	>1.2

^a The assumed meal size is 8 oz (0.227 kg). The ranges of chemical concentrations presented are conservative, e.g., the 12-meal-per-month levels represent the concentrations associated with 12 to 15.9 meals.

^b Chronic, systemic effects. An RfD is not available (NA) for this compound.

^c Cancer values represent tissue concentrations at a 1 in 100,000 risk level.

* Concentration reported in parts per trillion (nanogram per kg or 10⁻⁹ g/kg)

Notes:

- Consumption limits are based on an adult body weight of 70 kg and a cancer slope factor (CSF) of 1.56x10⁵ (mg/kg-d)⁻¹. No RfD available (June 1999).
- None = No consumption recommended.
- In cases where >16 meals per month are consumed, refer to Equations 3-1 and 3-2, Section 3.2.1.2, for methods to determine safe consumption limits.
- The detection limit for dioxins/furans is 1 x 10⁻⁶ mg/kg.
- Instructions for modifying the variables in this table are found in Section 3.3.
- Monthly limits are based on the total dose allowable over a 1-month period (based on the RfD). When the monthly limit is consumed in less than 1 month (e.g., in a few large meals), the daily dose may exceed the RfD (see Section 2.3).