TABLE OF CONTENTS

13 INTAKE OF HOME-PRODUCED FOODS 13-1
13.1 INTRODUCTION 13-1
13.2 RECOMMENDATIONS 13-1
13.3 KEY STUDY FOR INTAKE OF HOME-PRODUCED FOODS 13-6
13.3.1 U.S. EPA Analysis of NFCS 1987-1988 13-6
13.4 REFERENCES FOR CHAPTER 13 13-8

APPENDIX 13A FOOD CODES AND DEFINITIONS USED IN CHILD-SPECIFIC ANALYSIS OF THE 1987-1988 USDA NFCS DATA TO ESTIMATE HOME-PRODUCED INTAKE RATES 13A-1
APPENDIX 13B 1987-1988 NFCS FOOD CODES AND DEFINITIONS USED IN ESTIMATING FRACTION OF HOUSEHOLD FOOD INTAKE THAT IS HOME-PRODUCED 13B-1

LIST OF TABLES

Table 13-1. Summary of Recommended Values for Intake of Home-produced Foods (Consumers Only) . . 13-3
Table 13-2. Confidence in Recommendations for Intake of Home-produced Foods 13-4
Table 13-3. Weighted and Unweighted Number of Observations (Individuals) for NFCS Data Used in Child-specific Analysis of Food Intake 13-10
Table 13-4. Consumer Only Intake of Home-produced Foods (g/kg-day) 13-11
Table 13-5. Percent Weight Losses from Food Preparation 13-12
Table 13-6. Fraction of Food Intake that is Home-produced 13-13
Table 13A-1. Food Codes and Definitions Used in Child-specific Analysis of the 1987-1988 USDA NFCS Data to Estimate Intake of Home-produced Foods 13A-2
Table 13B-1. Food Codes and Definitions Used in Analysis of the 1987-1988 USDA NFCS Household Data to Estimate Fraction of Food Intake that is Home-produced 13B-2

13 INTAKE OF HOME-PRODUCED FOODS

13.1 INTRODUCTION

Ingestion of home-produced foods can be a pathway for exposure to environmental contaminants. Home-produced foods can become contaminated in a variety of ways. Ambient pollutants in the air may be deposited on plants, adsorbed onto or absorbed by the plants, or dissolved in rainfall or irrigation waters that contact the plants. Pollutants may also be adsorbed onto plant roots from contaminated soil and water. Finally, the addition of pesticides, soil additives, and fertilizers to crops or gardens may result in contamination of food products. Meat and dairy products can become contaminated if animals consume contaminated soil, water, or feed crops. Farmers, as well as rural and urban residents who consume home-produced foods, may be potentially exposed if these foods become contaminated. Exposure via the consumption of home-produced foods may be a significant route of exposure for these populations (U.S. EPA, 1989; U.S. EPA, 1996). For example, consumption of home-produced fruits, vegetables, game, and fish has been shown to have an impact on blood lead levels in areas where soil lead contamination exists (U.S. EPA, 1994). At Superfund sites where soil contamination is found, ingestion of home-produced foods has been considered a potential route of exposure (U.S. EPA, 1991; U.S. EPA, 1993). Assessing exposures to individuals who consume home-produced foods requires knowledge of intake rates of such foods.

Data from the 1987-1988 Nationwide Food Consumption Survey (NFCS) were used to generate intake rates for home-produced foods (U.S. EPA, 1997). Until 1988, USDA conducted the NFCS every 10 years to analyze the food consumption behavior and dietary status of Americans (USDA, 1992). While more recent food consumption surveys have been conducted to estimate food intake among the general population (e.g., USDA's Continuing Survey of Food Intake among Individuals [CSFII] and the National Health and Nutrition Examination Survey [NHANES]), these surveys have not collected data that can be used to estimate consumption of home-produced foods. Thus, the 1987-1988 NFCS data set is currently the best available source of information for this factor.

The 1987-1988 NFCS was conducted between April 1987 and August 1988. The survey used a statistical sampling technique designed to ensure that all seasons, geographic regions of the 48 conterminous states in the U.S., and socioeconomic and demographic groups were represented (USDA, 1994). There were two components of the NFCS. The household component collected information over a seven-day period on the socioeconomic and demographic characteristics of households, and the types, amount, value, and sources of foods consumed by the household (USDA, 1994). The individual intake component collected information on food intakes of individuals within each household over a three-day period (USDA, 1993). The sample size for the 1987-1988 survey was approximately 4,300 households (over 10,000 individuals; approximately 3,000 children). This was a decrease over the previous survey conducted in 1977-1978, which sampled approximately 15,000 households (over 36,000 individuals) (USDA, 1994). The sample size was lower in the 1987-1988 survey as a result of budgetary constraints and low response rate (38 percent for the household survey and 31percent for the individual survey) (USDA, 1993). The methods used to analyze the 1987-1988 NFCS data and the results of these analyses that pertain to children are presented in Section 13.3.

13.2 RECOMMENDATIONS

The data presented in this section may be used to assess exposure to contaminants in foods grown, raised, or caught at a specific site. The recommended values for mean and upper percentile (i.e., 95th percentile) intake rates among consumers of the various home-produced food groups are presented in Table 13-1; these rates can be converted to per capita rates by multiplying by the fraction of the population consuming these food groups during the survey period (See Section 13.3). Table 13-2 presents the confidence ratings for home-produced food intake. The data presented in this chapter for consumers of home-produced foods represent average daily intake rates of food items/groups over the seven-day survey period and do not account for variations in eating habits during the rest of the year; thus the recommended upper percentile values, as well as the percentiles of the distributions

presented in Section 13.3 may not necessarily reflect the long-term distribution of average daily intake of home produced foods.

Because the home-produced food intake rates presented in this chapter are based on foods as brought into the household and not in the form in which they are consumed, preparation loss factors should be applied, as appropriate. These factors are necessary to convert to intake rates to those that are representative of foods "as consumed". Additional conversions may be necessary to ensure that the form of the food used to estimate intake (e.g., wet or dry weight) is consistent with the form used to measure contaminant concentration (see Section 13.3).

The NFCS data used to generate intake rates of home-produced foods are over 20 years old and may not be reflective of current eating patterns among consumers of home-produced foods. Although USDA and others have conducted other food consumption studies since the release of the 1987-1988 NFCS, these studies do not include information on home-produced foods.

Recommended home-produced food intake rates are not provided for children under 1 year of age because the methodology used is based on apportionment of home-produced foods used by a household among the members of that household that consume those foods. It was assumed that the diets of children under 1 year of age differ markedly from that of other household members; thus, they were not assumed to consume any portion of the home-produced food brought into the home. Also, recommended home-produced food intake rates are not provided for individual food items for children because, in general, the sample size was too small to provide reliable data for individual age groups. However, if intake rates are needed for age groups under 1 year of age or for food items other than the major food groups presented here, data in Section 13.3 on the fraction of household intake that is home-produced may be used in conjunction with age-specific intake rates presented elsewhere in this handbook to estimate intake of home produced foods (U.S. EPA, 1997).

Table 13-1. Summary of Recommended Values for Intake of Home-produced Foods (Consumers Only)

Age Group[a]	Mean	95th Percentile	Multiple Percentiles	Source
	g/kg-day			
Home-produced Fruits				
1 to 2 years	8.7	60.6	See Table 13-4	U.S. EPA Analysis of 1987-1988 NFCS
3 to 5 years	4.1	8.9		
6 to 11 years	3.6	15.8		
12 to 19 years	1.9	8.3		
Home-produced Vegetables				
1 to 2 years	5.2	19.6	See Table 13-4	U.S. EPA Analysis of 1987-1988 NFCS
3 to 5 years	2.5	7.7		
6 to 11 years	2.0	6.2		
12 to 19 years	1.5	6.0		
Home-produced Meats				
1 to 2 years	3.7	10.0	See Table 13-4	U.S. EPA Analysis of 1987-1988 NFCS
3 to 5 years	3.6	9.1		
6 to 11 years	3.7	14.0		
12 to 19 years	1.7	4.3		
Home Caught Fish				
1 to 2 years	-[b]	-	See Table 13-4	U.S. EPA Analysis of 1987-1988 NFCS
3 to 5 years	-	-		
6 to 11 years	2.8	7.1		
12 to 19 years	1.5	4.7		

[a] Analysis was conducted prior to Agency's issuance of *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005).

[b] Data not presented for age groups/food groups where less than 20 observations were available.

Table 13-2. Confidence in Recommendations for Intake of Home-produced Foods

General Assessment Factors	Rationale	Rating
Soundness		Medium (Means) Low (Distributions)
Adequacy of Approach	The survey methodology and the approach to data analysis were adequate, but individual intakes were inferred from household consumption data. The sample size was large (approximately 3,000 children).	
Minimal (or Defined) Bias	Non-response bias can not be ruled out due to low response rate. Also, some biases may have occurred from using household data to estimate individual intake.	
Applicability and Utility		Low (Means & Short-term distributions) Low (Long-term distributions)
Exposure Factor of Interest	The analysis specifically addressed home-produced intake.	
Representativeness	Data from a nationwide survey, representative of the general U.S. population was used.	
Currency	The data were collected in 1987-1988.	
Data Collection Period	Household data were collected over 1 week.	
Clarity and Completeness		High
Accessibility	The methods used described to analyze the data are described in detail in this handbook; the primary data are accessible through USDA.	
Reproducibility	Sufficient detail on the methods used to analyze the data are presented to allow for the results to be reproduced.	
Quality Assurance	Quality assurance of NFCS data was good; quality control of the secondary data was sufficient.	

Table 13-2. Confidence in Recommendations for Intake of Home-produced Food (continued)

General Assessment Factors	Rationale	Rating
Variability and Uncertainty		Low to Medium
Variability in Population	Full distributions of home-produced intake rates were provided.	
Uncertainty	Sources of uncertainty include: individuals' estimates of food weights, allocation of household food to family members, and potential changes in eating patterns since these data were collected,	
Evaluation and Review		Medium
Peer Review	The study was reviewed by USDA and U.S. EPA.	
Number and Agreement of Studies	The number of studies is 1.	
Overall Rating		**Low-Medium** (means and short-term distributions) **Low** (long-term distributions)

13.3 KEY STUDY FOR INTAKE OF HOME-PRODUCED FOODS

13.3.1 U.S. EPA Analysis of NFCS 1987-1988

U.S. EPA's National Center for Environmental Assessment (NCEA) analyzed USDA's 1987-1988 NFCS data to generate intake rates for home-produced foods (U.S. EPA, 1997). For the purposes of this study, home-produced foods were defined as homegrown fruits and vegetables, meat and dairy products derived from consumer-raised livestock or game meat, and home caught fish. The food groups selected for analysis of children's home-produced food intake included major food groups such as total fruits, total vegetables, total meats, total dairy, total fish and shellfish. These food groups were identified in the NFCS data base according to NFCS-defined food codes. Appendix 13A presents the codes and definitions used to determine these major food groups. Foods with these codes, for which the source was identified as home-produced, were included in the analysis. This chapter presents the intake rate data for these major food groups, except total dairy, for various age ranges of children. An insufficient number of observations (i.e., less than 30 households) were available to allow for estimates of home-produced dairy products. Also, child-specific intake rates for individual food items (e.g., carrots, citrus fruit) were not estimated because, in general, the sample size was too small to provide reliable data for the individual age groups of interest.

The USDA data were adjusted by applying the sample weights calculated by USDA to the data set prior to analysis. The USDA sample weights were designed to "adjust for survey non-response and other vagaries of the sample selection process" (USDA, 1987-1988). Also, the USDA weights are calculated "so that the weighted sample total equals the known population total, in thousands, for several characteristics thought to be correlated with eating behavior" (USDA, 1987-1988). The unweighted sample included approximately 3,000 children (ages <1 to 19 years), which was weighted to reflect nearly 54 million children.

Although the individual intake component of the NFCS gives the best measure of the amount of each food group eaten by each individual in the household, it could not be used directly to measure consumption of home-produced food because the individual component does not identify the source of the food item (i.e., as home-produced or not). Therefore, an analytical method which incorporated data from both the household and individual survey components was developed to estimate individual home-produced food intake. The USDA household data were used to determine (1) the amount of each home-produced food item used during a week by household members and (2) the number of meals eaten in the household by each household member during a week. As measured by the NFCS, the amount of food "consumed" by the household is a measure of consumption in an economic sense, i.e., a measure of the weight of food brought into the household that has been consumed (used up) in some manner. In addition to food being consumed by persons, food may be used up by spoiling, by being discarded (e.g., inedible parts), through cooking processes, etc. Note that the household survey reports the total amount of each food item used in the household (whether by guests or household members); the amount used by household members was derived by multiplying the total amount used in the household by the proportion of all meals served in the household (during the survey week) that were consumed by household members.

The individual survey data were used to generate average sex- and age-specific serving sizes for each food item. These serving sizes were used during subsequent analyses to generate home-produced food intake rates for individual household members. Assuming that the proportion of the household quantity of each home-produced food item/group was a function of the number of meals and the mean sex- and age-specific serving size for each family member, individual intakes of home-produced food were calculated for all members of the survey population using the following general equation:

$$w_i = w_f \left[\frac{m_i q_i}{\sum_{i=1}^{n} m_i q_i} \right] \qquad \text{(Eqn. 13-1)}$$

where:

w_i = Home-produced amount of food item/group attributed to member *i* during the week (g/week);

w_f = Total quantity of home-produced food item/group used by the family members (g/week);

m_i = Number of meals of household food consumed by member *i* during the week (meals/week); and

q_i = Serving size for an individual within the age and sex category of the member (g/meal).

Daily intake of a home-produced food group was determined by dividing the weekly value (w_i) by seven. Intake rates were indexed to the self-reported body weight of the survey respondent and reported in units of g/kg-day. For the major food groups (fruits, vegetables, meats, and fish), distributions of home-produced intake among consumers were generated by age group. Consumers were defined as members of survey households who reported consumption of the food group of interest during the one week survey period.

The age categories used in the analysis were as follows: 1 to 2 years; 3 to 5 years; 6 to 11 years; and 12 to 19 years Because this analysis was conducted prior to issuance of U.S. EPA's *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005), the age groups used are not entirely consistent with recent guidelines. Intake rates were not calculated for children under 1 year because their diet differs markedly from that of other household members, and thus, the assumption that all household members share all foods would be invalid for this age group.

The intake data presented here for consumers of home-produced foods and the total number of individuals surveyed may be used to calculate the mean and the percentiles of the distribution of home-produced food consumption in the overall population (consumers and non-consumers) as follows:

Assuming that IR_p is the home-produced intake rate of the food group at the pth percentile and N_c is the weighted number of individuals consuming the home-produced food item, and N_T is the weighted total number of individuals surveyed, then N_T - N_c is the weighted number of individuals who reported zero consumption of the food item. In addition, there are (p/100 x N_c) individuals below the pth percentile. Therefore, the percentile that corresponds to a particular intake rate (IR_p) for the overall distribution of home-produced food consumption (including consumers and non-consumers) can be obtained by:

$$P^{th}_{overall} = 100 \text{ x } \frac{\left(\frac{P}{100} \text{ x } N_c + \left(N_T - N_c\right)\right)}{N_T} \quad \text{(Eqn. 13-2)}$$

Table 13-3 displays the weighted numbers N_T, as well as the unweighted total survey sample sizes, for each age category. Table 13-4 presents home-produced intake rates for fruits, vegetables, meats, and fish. These intake rates are based on the amount of household food consumption as well as age-specific serving size data.

USDA estimated preparation losses for various foods (USDA, 1975). For meats, a net cooking loss, which includes dripping and volatile losses, and a net post-cooking loss, which involves losses from cutting, bones, excess fat, scraps and juices, were derived for a variety of cuts and cooking methods. For total meats, U.S. EPA has averaged these losses across all meat types, cuts and cooking methods to obtain a mean net cooking loss and a mean net post-cooking loss. Mean percentage values for all meats and fish are provided in Table 13-5. For individual fruits and vegetables, USDA (1975) also gave cooking and post-cooking losses. These data, averaged across all types of fruits and vegetables to give mean net cooking and post cooking losses, are also provided in Table 13-5.

The following formula can be used to convert the home-produced intake rates tabulated here to rates reflecting actual consumption:

$$I_A = I \times \left(1 - L_1\right) \times \left(1 - L_2\right) \quad \text{(Eqn. 13-3)}$$

where:

I_A = the adjusted intake rate;
I = the tabulated intake rate;
L_1 = the cooking or preparation loss; and

L_2 = the post-cooking loss.

For fruits, corrections based on post-cooking losses only apply to fruits that are eaten in cooked forms. For raw forms of the fruits, paring or preparation loss data should be used to correct for losses from removal of skin, peel, core, caps, pits, stems, and defects, or draining of liquids from canned or frozen forms.

In calculating ingestion exposure, assessors should use consistent forms (e.g., "as-consumed" or dry weight) in combining intake rates with contaminant concentrations, as discussed in Chapter 9 of this handbook.

The USDA 1987-1988 NFCS household data were also used to estimate the fraction of household intake that can be attributed to home-produced foods (Table 13-6). The analysis was conducted for the major food groups (i.e., total meat, dairy, fruits, vegetables, and fish), as well as for a variety of individual food items (e.g., apples, tomatoes, beef, etc.). The fraction of intake that was home-produced was calculated as the ratio of total intake of the home-produced food item/group by the survey population to the total intake of all forms of the food by the survey population. The food codes used in this analysis are presented in Appendix 13-B.

The USDA NFCS data set is the largest publicly available source of information on home-produced food consumption habits in the United States. The advantages of using this data set are that it is expected to be representative of the U.S. population and that it provides information on a wide variety of food groups. However, the data collected by the USDA NFCS are based on short-term dietary recall and the intake distributions generated from this data set may not accurately reflect long-term intake patterns, particularly with respect to the tails (extremes) of the distributions. Also, the two survey components (i.e., household and individual) do not define food items/groups in a consistent manner; as a result, some errors may be introduced into these analyses because the two survey components are linked. The results presented here may also be biased by assumptions that are inherent in the analytical method utilized. The analytical method may not capture all high-end consumers within households because average serving sizes are used in calculating the proportion of home-produced food consumed by each household member. Thus, for instance, in a two-person household where one member had high intake and one had low intake, the method used here would assume that both members had an equal and moderate level of intake. In addition, the analyses assume that all family members consume a portion of the home-produced food used within the household. However, not all family members may consume each home-produced food item and serving sizes allocated here may not be entirely representative of the portion of household foods consumed by each family member. As was mentioned earlier, no analyses were performed for children under 1 year age.

The preparation loss factors discussed above are intended to convert intake rates based on "household consumption" to rates reflective of what individuals actually consume. However, these factors do not include losses to spoilage, feeding to pets, food thrown away, etc. It should also be noted that because this analysis is based on the 1987-1988 NFCS, it may not reflect recent changes in food consumption patterns. The low response rate associated with the 1987-1988 NFCS also contributes to the uncertainty of the home-produced intake rates generated using these data.

13.4 REFERENCES FOR CHAPTER 13

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Table 13-3. Weighted and Unweighted Number of Observations (Individuals) for NFCS Data Used in Child-specific Analysis of Food Intake

Age Group	Number of Observations	
	weighted	unweighted
<1 year	2,814,000	156
1 to 2 years	5,699,000	321
3 to 5 years	8,103,000	461
6 to 11 years	16,711,000	937
12 to 19 years	20,488,000	1,084
Total	53,815,000	2,959

weighted = Weighted number of observations.
unweighted = Unweighted number of observations.

Table 13-4. Consumer Only Intake of Home-produced Foods (g/kg-day)[a]

Age (years)	Nc wgtd	Nc unwgtd	% Consuming	Mean	SE	P1	P5	P10	P25	P50	P75	P90	P95	P99	P100
Home-produced Fruits															
1 to 2	360,000	23	6.3	8.7	3.1	1.0	1.1	1.3	1.6	3.5	8.0	19.3	60.6	60.6	60.6
3 to 5	550,000	34	6.8	4.1	1.5	0.0	0.0	0.4	1.0	1.9	2.7	6.0	8.91	48.3	48.3
6 to 11	1,044,000	75	6.3	3.6	0.7	0.0	0.2	0.4	0.7	1.3	3.1	11.8	15.8	32.2	32.2
12 to 19	1,189,000	67	5.8	1.9	0.4	0.1	0.1	0.3	0.4	0.7	2.4	6.8	8.3	18.5	18.5
Home-produced Vegetables															
1 to 2	951,000	53	16.7	5.2	0.9	0.0	0.2	0.4	1.2	3.3	5.8	13.1	19.6	27.0	27.0
3 to 5	1,235,000	76	15.2	2.5	0.3	0.0	0.1	0.4	0.7	1.3	3.9	6.4	7.7	10.6	12.8
6 to 11	3,024,000	171	18.1	2.0	0.3	0.0	0.1	0.2	0.4	0.9	2.2	4.6	6.2	17.6	23.6
12 to 19	3,293,000	183	16.1	1.5	0.1	0.0	0.1	0.1	0.3	0.8	1.8	3.7	6.0	7.7	9.0
Home-produced Meats															
1 to 2	276,000	22	4.8	3.7	0.6	0.4	1.0	1.0	1.2	2.7	4.7	8.7	10.0	11.5	11.5
3 to 5	396,000	26	4.9	3.6	0.5	0.8	0.8	1.5	2.2	2.8	3.7	7.8	9.1	13.0	13.0
6 to 11	1,064,000	65	6.4	3.7	0.5	0.4	0.7	0.7	1.3	2.1	4.7	8.0	14.0	15.3	15.3
12 to 19	1,272,000	78	6.2	1.7	0.2	0.2	0.3	0.5	0.6	1.2	2.4	3.7	4.3	6.8	7.5
Home-caught Fish															
1 to 2	82,000	6	1.4	*	*	*	*	*	*	*	*	*	*	*	*
3 to 5	142,000	11	1.8	*	*	*	*	*	*	*	*	*	*	*	*
6 to 11	382,000	29	2.3	2.8	0.8	0.2	0.2	0.2	0.2	0.6	1.0	3.7	7.1	7.9	25.3
12 to 19	346,000	21	1.7	1.5	0.4	0.2	0.2	0.2	0.2	0.3	1.0	1.8	4.7	6.7	8.4

[a] Analysis was conducted prior to Agency's issuance of *Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005).
SE = Standard error.
P = Percentile of the distribution.
Nc wgtd = Weighted number of consumers.
Nc unwgtd = Unweighted number of consumers in survey.
* = Less than 20 observations.

Source: Based on U.S. EPA's analyses of the 1987-1988 NFCS.

Table 13-5. Percent Weight Losses from Food Preparation

Food Group	Mean Net Preparation/Cooking Loss (%)	Mean Net Post Cooking (%)
Meats[a]	29.7[b]	29.7[c]
Fish and shellfish[d]	31.5[b]	10.5[c]
Fruits	25.4[e]	30.5[f]
Vegetables[g]	12.4[h]	22[i]

[a] Averaged over various cuts and preparation methods for various meats including beef, pork, chicken, turkey, lamb, and veal.
[b] Includes dripping and volatile losses during cooking.
[c] Includes losses from cutting, shrinkage, excess fat, bones, scraps, and juices.
[d] Averaged over a variety of fish and shellfish, to include: bass, bluefish, butterfish, cod, flounder, haddock, halibut, lake trout, mackerel, perch, porgy, red snapper, rockfish, salmon, sea trout, shad, smelt, sole, spot, squid, swordfish steak, trout, whitefish, clams, crab, crayfish, lobster, oysters, and shrimp and shrimp dishes.
[e] Based on preparation losses. Averaged over apples, pears, peaches, strawberries, and oranges. Includes losses from removal of skin or peel, core or pit, stems or caps, seeds, and defects. Also, includes losses from removal of drained liquids from canned or frozen forms.
[f] Averaged over apples and peaches. Include losses from draining cooked forms.
[g] Averaged over various vegetables, to include: asparagus, beets, broccoli, cabbage, carrots, corn, cucumbers, lettuce, lima beans, okra, onions, green peas, peppers, pumpkins, snap beams, tomatoes, and potatoes.
[h] Includes losses due to paring, trimming, flowering the stalk, thawing, draining, scraping, shelling, slicing, husking, chopping, and dicing and gains from the addition of water, fat, or other ingredients. Averaged over various preparation methods.
[i] Includes losses from draining or removal of skin. Based on potatoes only.

Source: U.S. EPA, 1997 (Derived from USDA, 1975).

Table 13-6. Fraction of Food Intake that is Home-produced

	All Households	Households who garden	Households who farm
Total Fruits	0.04	0.101	0.161
Apples	0.030	0.070	0.292
Peaches	0.147	0.316	0.461
Pears	0.067	0.169	0.606
Strawberries	0.111	0.232	0.057
Other Berries	0.217	0.306	0.548
Citrus	0.038	0.087	0.005
Other	0.042	0.107	0.227
	All Households	Households who garden	Households who farm
Total Vegetables	0.068	0.173	0.308
Asparagus	0.063	0.125	0.432
Beets	0.203	0.420	0.316
Broccoli	0.015	0.043	0.159
Cabbage	0.038	0.099	0.219
Carrots	0.043	0.103	0.185
Corn	0.078	0.220	0.524
Cucumbers	0.148	0.349	0.524
Lettuce	0.010	0.031	0.063
Lima Beans	0.121	0.258	0.103
Okra	0.270	0.618	0.821
Onions	0.056	0.148	0.361
Peas	0.069	0.193	0.308
Peppers	0.107	0.246	0.564
Pumpkin	0.155	0.230	0.824
Snap Beans	0.155	0.384	0.623
Tomatoes	0.184	0.398	0.616
White Potatoes	0.038	0.090	0.134
	All Households	Households who raise animals/hunt	Households who farm
Total Meats	0.024	0.306	0.319
Beef	0.038	0.485	0.478
Game	0.276	0.729	-
Pork	0.013	0.242	0.239
Poultry	0.011	0.156	0.151
	All Households	Households who raise animals	Households who farm
Total Dairy	0.012	0.207	0.254
Eggs	0.014	0.146	0.214
	All Households	Households who fish	--
Total fish	0.094	0.325	--

\- = No data.

Source: U.S. EPA Analysis of 1987-1988 NFCS.

APPENDIX 13A

FOOD CODES AND DEFINITIONS USED IN CHILD-SPECIFIC ANALYSIS OF THE 1987-1988 USDA NFCS DATA TO ESTIMATE HOME-PRODUCED INTAKE RATES

Table 13A-1. Food Codes and Definitions Used in Child-specific Analysis of the 1987-1988 USDA NFCS Data to Estimate Intake of Home-produced Foods

Food Product	Household Code/Definition[a]	Individual Code
	MAJOR FOOD GROUPS	
Total Fruits	50- Fresh Fruits citrus other vitamin-C rich other fruits 512- Commercially Canned Fruits 522- Commercially Frozen Fruits 533- Canned Fruit Juice 534- Frozen Fruit Juice 535- Aseptically Packed Fruit Juice 536- Fresh Fruit Juice 542- Dried Fruits (includes baby foods)	6- Fruits citrus fruits and juices dried fruits other fruits fruits/juices & nectar fruit/juices baby food (includes baby foods)
Total Vegetables	48- Potatoes, Sweet potatoes 49- Fresh Vegetables dark green deep yellow tomatoes light green other 511- Commercially Canned Vegetables 521- Commercially Frozen Vegetables 531- Canned Vegetable Juice 532- Frozen Vegetable Juice 537- Fresh Vegetable Juice 538- Aseptically Packed Vegetable Juice 541- Dried Vegetables (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures/dinners)	7- Vegetables (all forms) white potatoes & PR starchy dark green vegetables deep yellow vegetables tomatoes and tom. mixtures other vegetables veg. and mixtures/baby food veg. with meat mixtures (includes baby foods; mixtures, mostly vegetables)
Total Meats	44- Meat beef pork veal lamb mutton goat game lunch meat mixtures 451- Poultry (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)	20- Meat, type not specified 21- Beef 22- Pork 23- Lamb, veal, game, carcass meat 24- Poultry 25- Organ meats, sausages, lunchmeats, meat spreads (excludes meat, poultry, and fish with non-meat items; frozen plate meals; soups and gravies with meat, poultry and fish base; and gelatin-based drinks; includes baby foods)

Table 13A-1. Food Codes and Definitions Used in Child-specific Analysis of the 1987-1988 USDA NFCS Data to Estimate Intake of Home-produced Foods (continued)

Food Product	Household Code/Definition[1]	Individual Code
MAJOR FOOD GROUPS		
Total Dairy	40- Milk Equivalent fresh fluid milk processed milk cream and cream substitutes frozen desserts with milk cheese dairy-based dips (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners)	1- Milk and Milk Products milk and milk drinks cream and cream substitutes milk desserts, sauces, and gravies cheeses (includes regular fluid milk, human milk, imitation milk products, yogurt, milk-based meal replacements, and infant formulas)
Total Fish	452- Fish, Shellfish various species fresh, frozen, commercial, dried (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners)	26- Fish, Shellfish various species and forms (excludes meat, poultry, and fish with non-meat items; frozen plate meals; soups and gravies with meat, poultry and fish base; and gelatin-based drinks)

[a] Food items within these categories that were identified by the household as being home-produced or home-caught (i.e., source code pertaining to home produced foods) were included in the analysis.

APPENDIX 13B

1987-1988 NFCS FOOD CODES AND DEFINITIONS USED IN ESTIMATING FRACTION OF HOUSEHOLD FOOD INTAKE THAT IS HOME-PRODUCED

Table 13B-1. Food Codes and Definitions Used in Analysis of the 1987-1988 USDA NFCS Household Data to Estimate Fraction of Food Intake that is Home-produced

Food Product	**Household Code/Definition**
	INDIVIDUAL FOODS
White Potatoes	4811- White Potatoes, fresh 4821- White Potatoes, commercially canned 4831- White Potatoes, commercially frozen 4841- White Potatoes, dehydrated 4851- White Potatoes, chips, sticks, salad (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners)
Peppers	4913- Green/Red Peppers, fresh 5111201 Sweet Green Peppers, commercially canned 5111202 Hot Chili Peppers, commercially canned 5211301 Sweet Green Peppers, commercially frozen 5211302 Green Chili Peppers, commercially frozen 5211303 Red Chili Peppers, commercially frozen 5413112 Sweet Green Peppers, dry 5413113 Red Chili Peppers, dry (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners)
Onions	4953- Onions, Garlic, fresh onions chives garlic leeks 5114908 Garlic Pulp, raw 5114915 Onions, commercially canned 5213722 Onions, commercially frozen 5213723 Onions with Sauce, commercially frozen 5413103 Chives, dried 5413105 Garlic Flakes, dried 5413110 Onion Flakes, dried (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners)
Corn	4956- Corn, fresh 5114601 Yellow Corn, commercially canned 5114602 White Corn, commercially canned 5114603 Yellow Creamed Corn, commercially canned 5114604 White Creamed Corn, commercially canned 5114605 Corn on Cob, commercially canned 5114607 Hominy, canned 5115306 Low Sodium Corn, commercially canned 5115307 Low Sodium Cr. Corn, commercially canned 5213501 Yellow Corn on Cob, commercially frozen 5213502 Yellow Corn off Cob, commercially frozen 5213503 Yell. Corn with Sauce, commercially frozen 5213504 Corn with other Veg., commercially frozen 5213505 White Corn on Cob, commercially frozen 5213506 White Corn off Cob, commercially frozen 5213507 Wh. Corn with Sauce, commercially frozen 5413104 Corn, dried 5413106 Hominy, dry 5413603 Corn, instant baby food (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby food)e

Table 13B-1. Food Codes and Definitions Used in Analysis of the 1987-1988 USDA NFCS Household Data to Estimate Fraction of Food Intake that is Home-produced (continued)

Food Product	**Household Code/Definition**
Apples	5031- Apples, fresh 5122101 Applesauce with sugar, commercially canned 5122102 Applesauce without sugar, comm. canned 5122103 Apple Pie Filling, commercially canned 5122104 Apples, Applesauce, baby/jr., comm. canned 5122106 Apple Pie Filling, Low Cal., comm. canned 5223101 Apple Slices, commercially frozen 5332101 Apple Juice, canned 5332102 Apple Juice, baby, Comm. canned 5342201 Apple Juice, comm. frozen 5342202 Apple Juice, home frozen 5352101 Apple Juice, aseptically packed 5362101 Apple Juice, fresh 5423101 Apples, dried (includes baby food; except mixtures)
Tomatoes	4931- Tomatoes, fresh 5113- Tomatoes, commercially canned 5115201 Tomatoes, low sodium, commercially canned 5115202 Tomato Sauce, low sodium, comm. canned 5115203 Tomato Paste, low sodium, comm. canned 5115204 Tomato Puree, low sodium, comm. canned 5311- Canned Tomato Juice and Tomato Mixtures 5321- Frozen Tomato Juice 5371- Fresh Tomato Juice 5381102 Tomato Juice, aseptically packed 5413115 Tomatoes, dry 5614- Tomato Soup 5624- Condensed Tomato Soup 5654- Dry Tomato Soup (does not include mixtures, and ready-to-eat dinners)
Snap Beans	4943- Snap or Wax Beans, fresh 5114401 Green or Snap Beans, commercially canned 5114402 Wax or Yellow Beans, commercially canned 5114403 Beans, baby/jr., commercially canned 5115302 Green Beans, low sodium, comm. canned 5115303 Yell. or Wax Beans, low sod., comm. canned 5213301 Snap or Green Beans, comm. frozen 5213302 Snap or Green w/sauce, comm. frozen 5213303 Snap or Green Beans w/other veg., comm. fr. 5213304 Sp. or Gr. Beans w/other veg./sc., comm. fr. 5213305 Wax or Yell. Beans, comm. frozen (does not include soups, mixtures, and ready-to-eat dinners; includes baby foods)
Beef	441- Beef (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Pork	442- Pork (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)

Table 13B-1. Food Codes and Definitions Used in Analysis of the 1987-1988 USDA NFCS Household Data to Estimate Fraction of Food Intake that is Home-produced (continued)

Food Product	Household Code/Definition
Game	445- Variety Meat, Game (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Poultry	451- Poultry (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Eggs	46- Eggs (fresh equivalent) fresh processed eggs, substitutes (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Broccoli	4912- Fresh Broccoli (and home canned/froz.) 5111203 Broccoli, comm. canned 52112- Comm. Frozen Broccoli (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Carrots	4921- Fresh Carrots (and home canned/froz.) 51121- Comm. Canned Carrots 5115101 Carrots, Low Sodium, Comm. Canned 52121- Comm. Frozen Carrots 5312103 Comm. Canned Carrot Juice 5372102 Carrot Juice Fresh 5413502 Carrots, Dried Baby Food (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Pumpkin	4922- Fresh Pumpkin, Winter Squash (and home canned/froz.) 51122- Pumpkin/Squash, Baby or Junior, Comm. Canned 52122- Winter Squash, Comm. Frozen 5413504 Squash, Dried Baby Food (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Asparagus	4941- Fresh Asparagus (and home canned/froz.) 5114101 Comm. Canned Asparagus 5115301 Asparagus, Low Sodium, Comm. Canned 52131- Comm. Frozen Asparagus (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Lima Beans	4942- Fresh Lima and Fava Beans (and home canned/froz.) 5114204 Comm. Canned Mature Lima Beans 5114301 Comm. Canned Green Lima Beans 5115304 Comm. Canned Low Sodium Lima Beans 52132- Comm. Frozen Lima Beans 54111- Dried Lima Beans 5411306 Dried Fava Beans (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures; does not include succotash)

Table 13B-1. Food Codes and Definitions Used in Analysis of the 1987-1988 USDA NFCS Household Data to Estimate Fraction of Food Intake that is Home-produced (continued)

Food Product	**Household Code/Definition**
Cabbage	4944- Fresh Cabbage (and home canned/froz.) 4958601 Sauerkraut, home canned or pkgd 5114801 Sauerkraut, comm. canned 5114904 Comm. Canned Cabbage 5114905 Comm. Canned Cabbage (no sauce; incl. baby) 5115501 Sauerkraut, low sodium., comm. canned 5312102 Sauerkraut Juice, comm. canned (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Lettuce	4945- Fresh Lettuce, French Endive (and home canned/froz.) (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Okra	4946- Fresh Okra (and home canned/froz.) 5114914 Comm. Canned Okra 5213720 Comm. Frozen Okra 5213721 Comm. Frozen Okra with Oth. Veg. & Sauce (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Peas	4947- Fresh Peas (and home canned/froz.) 51147- Comm Canned Peas (incl. baby) 5115310 Low Sodium Green or English Peas (canned) 5115314 Low Sod. Blackeye, Gr. or Imm. Peas (canned) 5114205 Blackeyed Peas, comm. canned 52134- Comm. Frozen Peas 5412- Dried Peas and Lentils (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Cucumbers	4952- Fresh Cucumbers (and home canned/froz.) (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Beets	4954- Fresh Beets (and home canned/froz.) 51145- Comm. Canned Beets (incl. baby) 5115305 Low Sodium Beets (canned) 5213714 Comm. Frozen Beets 5312104 Beet Juice (does not include soups, sauces, gravies, mixtures, and ready-to-eat dinners; includes baby foods except mixtures)
Strawberries	5022- Fresh Strawberries 5122801 Comm. Canned Strawberries with sugar 5122802 Comm. Canned Strawberries without sugar 5122803 Canned Strawberry Pie Filling 5222- Comm. Frozen Strawberries (does not include ready-to-eat dinners; includes baby foods except mixtures)

Table 13B-1. Food Codes and Definitions Used in Analysis of the 1987-1988 USDA NFCS Household Data to Estimate Fraction of Food Intake that is Home-produced (continued)

Food Product	Household Code/Definition
Other Berries	5033- Fresh Berries Other than Strawberries 5122804 Comm. Canned Blackberries with sugar 5122805 Comm. Canned Blackberries without sugar 5122806 Comm. Canned Blueberries with sugar 5122807 Comm. Canned Blueberries without sugar 5122808 Canned Blueberry Pie Filling 5122809 Comm. Canned Gooseberries with sugar 5122810 Comm. Canned Gooseberries without sugar 5122811 Comm. Canned Raspberries with sugar 5122812 Comm. Canned Raspberries without sugar 5122813 Comm. Canned Cranberry Sauce 5122815 Comm. Canned Cranberry-Orange Relish 52233- Comm. Frozen Berries (not strawberries) 5332404 Blackberry Juice (home and comm. canned) 5423114 Dried Berries (not strawberries) (does not include ready-to-eat dinners; includes baby foods except mixtures)
Peaches	5036- Fresh Peaches 51224- Comm. Canned Peaches (incl. baby) 5223601 Comm. Frozen Peaches 5332405 Home Canned Peach Juice 5423105 Dried Peaches (baby) 5423106 Dried Peaches (does not include ready-to-eat dinners; includes baby foods except mixtures)
Pears	5037- Fresh Pears 51225- Comm. Canned Pears (incl. baby) 5332403 Comm. Canned Pear Juice, baby 5362204 Fresh Pear Juice 5423107 Dried Pears (does not include ready-to-eat dinners; includes baby foods except mixtures)
Citrus Fruits	501- Fresh Citrus Fruits 5121 Comm. Canned Citrus Fruits 5331 Canned Citrus and Citrus Blend Juice 5341 Frozen Citrus and Citrus Blend Juice 5351 Aseptically Packed Citrus and Citr. Blend Juice 5361 Fresh Citrus and Citrus Blend Juice (includes baby foods; excludes dried fruits)
Other Fruits	502- Fresh Other Vitamin C-Rich Fruits 503- Fresh Other Fruits 5122- Comm. Canned Fruits Other than Citrus 5222- Frozen Strawberries 5332- Frozen Other than Citr. or Vitamin C-Rich Fr. 5333- Canned Fruit Juice Other than Citrus 5352- Frozen Juices Other than Citrus 5362- Aseptically Packed Fruit Juice Other than Citr. 542- Fresh Fruit Juice Other than Citrus Dry Fruits (includes baby foods; excludes dried fruits)