PNL-SA--17296-HEDR

DE90 005543

ESTIMATIONS OF TRADITIONAL NATIVE AMERICAN DIETS IN THE COLUMBIA PLATEAU

E. S. Hunn, PhD.
C. L. Bruneau

August 1989

Presented at the
HEDR Native American Workshop
Richland, Washington
August 8-9, 1989

Work supported by
the U. S. Department of Energy
under Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Richland, Washington 99352

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

ESTIMATIONS OF TRADITIONAL NATIVE AMERICAN DIETS IN THE COLUMBIA PLATEAU

Eugene S. Hunn, PhD.

Eugene S. Hunn

Department of Anthropology

University of Washington

Seattle, WA 98195

Prepared for the Hanford Environmental Dose Reconstruction Project for submission to Batelle Pacific Northwest Laboratories, P. O. Box 999, Richland, WA 99352.

The goal of the HEDR project is to estimate as accurately as possible the total radiation exposure of people in the vicinity of the Hanford Nuclear Reserve during the periods 1944-1947 and 1964-1966. The present report is restricted to the subsidiary goal of estimating weekly per-capita consumption levels by season for adult male Native Americans within a ten-county target area. These estimates are to be reported in terms of general categories of traditional and non-traditional foods and for three contrasting "tribal" groups, the "River Yakima," the Nez Perce, and the Colville.

GENERAL PROCEDURES: I will first characterize a typical "traditional" Plateau Indian diet (that is, as it was ca. 1800 AD), modified for each of the three tribal groups to reflect ecological differences among them. I will then characterize how traditional diets would have been modified by the substitution of non-traditional foods for traditional foods of each general type for the target time periods. As systematic studies of actual consumption patterns for the traditional period do not exist, traditional consumption patterns must be inferred from other data. My basic strategy here is to assume that traditional diets provided adequate, but not excessive, quantities of all essential nutrients. I also assume that each family was essentially self-sufficient with regard to food. Though intra-regional trade in foodstuffs was significant, in my opinion such trade served socio-political functions primarily. It did tend to minimize intraregional dietary contrasts by facilitating the exchange of surpluses of roots and game produced in tributary stream

communities for surpluses of fish produced by communities with direct access to the most productive Columbia River fisheries. The harvest of resources outside the region (such as bison in the Plains) was also of minimal significance for traditional Plateau diets.

My next assumption is that in most cases the key nutrient is food energy, measured in (kilo-)calories. Only in the case of green vegetables--for which Vitamin C is critical--do I presume that a nutrient other than food energy is limiting. Lee (1979:271) in his study of Kalahari San foragers cites 1975 calories per person per day as an appropriate overall San average (for men, women, and children), with 2250 recommended for an adult male (115% of the average). The San, however, are quite small with men averaging 110 lbs and women 92. U. S. recommended dietary allowances are based on a "standard" 154 pound adult male and 132 pound adult female (Encyclopedia Americana). We may assume that Plateau Native American people at first contact weighed in somewhere between these extremes. Since the U. S. allowance for an adult male is 2700 calories per day, I will adopt the assumption that 2400 was adequate to sustain a Plateau Indian adult male. Given the abundance of fish and fruit in the Plateau diet we may assume that a diet adequate in calories will also be adequate in protein, vitamins, and minerals.

The next step is to prorate these calories to the various categories of traditional foods. To do this we rely on ethnohistorical, ethnographic, and ecological evidence in addition to published nutritional values (e.g., Watt and Merrill

1963, Keely et al. 1982, Norton et al. 1984).

Finally I assess how and to what degree these traditional dietary parameters had been modified by 1944-1947 and 1964-1966.

EXPOSED VEGETABLES: Stems, leaf stalks, and sprouts of at least eight species were regularly harvested March-June. They were eaten fresh. Sprouts were not exposed to the air; most stems and leaf stalks were peeled before being eaten, with the exception of Lomatium nudicaule, which, however, was the most popular green and the one that contributed the greatest quantity to the traditional diet (an estimated 50% of the total). The quantities cited in the "traditional diet" table reflect the U. S. RDA of 45 mg for adults. I have used 25 mg/100 gms (112 mg/pound) as a rough average of the values cited by Norton et al. (1984:225). The minimal figure is adequate to meet that requirement (in the absence of fresh or dried fruits); the maximal figure is twice the minimum, based on the assumption that the consumption of greens in the spring compensated for deficiencies in this vitamin suffered during the winter.

1944-1947/1964-1966: Traditionalist families continued to actively seek out at least the more popular species; greens of several species are regularly served today at spring Waashat services and would have been available in that context in the 1940's as well. Preference for and access to these species remained at traditional levels at this time, but the ready availability of non-traditional alternatives from home gardens and grocery stores would have led to some replacement of the traditional greens by leafy and other green vegetables from non-

traditional sources. My rough estimates of the effects of this trend:

1940's:	native greens/non-native leafy vegetables
traditional families	80%/20%
non-traditional families	20%/80%
1960's	
traditional families	50%/50%
non-traditional families	10%/90%

OTHER VEGETABLES: This category is composed of various types of underground starch storage organs such as tubers, bulbs, corms, etc. Hunn (1981) has argued that this category of traditional food supplied over 50% of total calories for traditional Plateau diets. He estimates that major root staples yielded 1300 calories per person per day (at ca. 450 calories per pound) averaged over the year (pg. 130). Adult male consumption is calculated at 115% of the overall average, which comes to 23 pounds of roots per week. Fresh roots are available primarily April-June. Large quantities of roots are dried for consumption throughout the year. Seasonal consumption is thus assumed to be constant with the proportions of fresh and stored roots reflecting the seasonal availability of fresh roots. There is no evidence to suggest that traditionally root consumption varied significantly within the region (cf. Marshall 1977, Turner, Bouchard, and Kennedy 1980), though it is likely that communities without direct access to the main Columbia fisheries exchanged surpluses of dried roots for fish.

1944-1947/1964-1966: Lithosol root species (e.g., Lomatium

spp., Lewisia) remained readily available, as such habitats were of very limited utility for farming or cattle grazing. Vernal meadows species (most notably, Camassia quamash) were significantly less important due to the conversion of the most productive of such habitats to agriculture by white settlers. In the 1940's motor vehicle travel was replacing horse and buggy, but the significance of this on the harvest of traditional root foods is not obvious. Native root foods of several species are very important today at Waashat Sunday feasts and were at least as important during the 1960's and likely more important during the 1940's. Traditional root foods were most likely replaced in part by equivalent (or greater) quantities of potatoes ("other vegetables") and breads ("grains"). As potatoes are closer analogs of the traditional products, I assume that the more traditional diets favored potatoes over breads. My estimates are as follows:

	native roots/non-native roots/non-native grains
1940's:	
traditional families	60%/30%/10%
non-traditional families	20%/40%/40%
1960's	
traditional families	30%/40%/30%
non-traditional families	10%/40%/50%

GRAINS: A conspicuous feature of Plateau traditional diet (compared to that of the Great Basin or California) was the very minor role of seeds in the diet. Those widely reported include acorns (Quercus garryana), hazelnuts, pinenuts (Pinus albicaulis), and balsamroot (Balsamorhiza spp.). Oak and

whitebark pine are of quite restricted distribution, while balsamroot seeds were reported as eaten only by some groups. Harvests were in the fall with some stored for winter consumption. The figure cited assumes that one "bushel" (i.e., 66 pounds) was harvested per family (of 4) per year. As these food items were difficult to harvest and to process, they likely played a minimal role in Plateau Native American diet after 1940. Bread foods readily replaced this traditional nutritional resource.

FRUITS/BERRIES: Fresh fruits were available primarily July-October. The most important species, e.g., Vaccinium membranaceum, Prunus virginiana) were also dried for winter consumption. Fresh fruits are on average 85% water, thus they contribute few calories per pound. I use here figures for blueberries in Watt and Merrill of 259 calories per pound (458 if packed in syrup, see below). The quantities cited represent an average consumption for an adult male of 3 pounds per week.

1944-1947/1964-1966: The popularity and accessibility of traditionl fruits remains high. However, an important shift in processing is underway, from drying to canning. The sugar added in canning in effect replaces a fraction (estimated at 40%) of the native fruit as a source of food energy:

	native fruits/sugar and non-native fruits/sweets
1940's:	
traditional families	60%/40%
non-traditional families	30%/70%
1960's	
traditional families	40%/60%

non-traditional families 20%/80%

WILD BIRD EGGS: This was always a minor adjunct to the Plateau diet. Canada goose and duck eggs were likely the most important. They are available March-June. There is no evidence that eggs were stored for later consumption. Duck and goose eggs are 25% higher in calories per pound than hen's eggs; duck eggs are equal to or up to 50% larger than (large, 2 ounce) hen's eggs, while goose eggs are equivalent to 4 or 5 hen's eggs. One goose egg per week during spring would have provided an increment of ca. 15 calories per person per day averaged over the year. Wild bird eggs were likely replaced by hen's eggs--available year around--by 1940 in all diets. One hen's egg per week throughout the year would be roughly equivalent in caloric value to the traditional estimate.

GAME: Mammals regularly hunted for food on the Plateau include big game species such as mule deer, elk, and mountain goat; and small game such as yellow-bellied marmot, Townsend's ground squirrel, western gray squirrel, jackrabbits, and mountain cottontail. Meat not consumed immediately was dried for later consumption. I use 60% as the value of the edible portion of game and 572 calories per pound (meat only, lean venison). Assuming that game contributed an overall average of 125 calories per person per day (100 for large game, 25 for small game) along the main Columbia River (where salmon availability was highest) and twice that away from the main Columbia (in compensation for reduced salmon availabiliby, see below), an adult male would need to consume 1.75 pounds of game meat per week. This level of

consumption is equivalent to 530 pounds (minimal) or 1060 pounds (maximal) of game "on the hoof" or the equivalent of 3 (minimal) or 6 (maximal) mule deer per year per family of four. Summer consumption of game was minimal due to the seasonal focus on fishing.

1944-1947/1964-1966: Mountain goats are no longer important prey and the smaller game species are likewise rarely hunted (with the exception of an occasional jackrabbit or cottontail). Mule and black-tailed deer and elk remain important. Most hunting is conducted in the mountains fringing the Columbia Basin, with a distinct preference for hunting on reservation lands. Though guns and motor vehicle transport partly offset the inhibiting effects of restricted hunting access and competing employments, it seems reasonable to assume a significant reduction in the per capita consumption of wild game meat in favor of such readily available substitutes as beef and pork. Traditionalists, however, still stress the value of a man contributing deer and elk meat to his extended family. My estimates of twentieth century consumption values are as follows:

	native game/beef & pork
1940's:	
traditional families	60%/40%
non-traditional families	20%/80%
1960's	
traditional families	30%/70%
non-traditional families	10%/90%

WILD BIRDS: The most important species were four grouse plus Canada goose and a variety of ducks. Bird hunting was never a

dominant cultural theme. I have thus estimated that birds contributed calorically on a par with small game, that is, 25 calories per person per day averaged over the year along the Columbia and twice that away from the river. This is equivalent to 0.3 and 0.6 pounds per adult male per week respectively, or the equivalent of 9/18 sharp-tailed grouse or 2/4 Canada geese per person per year.

1944-1947/1964-1966: Open country grouse were significantly reduced in abudance due to habitat alteration, especially subsequent to the irrigation of the Columbia Basin by the Grand Coulee diversion. Waterfowl, on the other hand, have been increasing due to expanded wetland habitat for the same reason. Sage and sharp-tailed grouse have also been replaced in part by introduced ring-necked pheasants, partridges, and quail. However, bird hunting seems to have been of only incidental interest after 1940. It is likely that commercial poultry had essentially replaced wild birds in the diet by the 1960's and had replaced 50% of wild bird consumption in traditional families and 100% in non-traditional families by 1944-1947.

ANADROMOUS FISH: Four species of salmon, steelhead trout, and lamprey "eels" were available through most of the region (sturgeon was not eaten traditionally, at least in the Sahaptian area of the Yakima and Nez Perce). Salmon harvests (including steelhead) have been estimated by Craig and Hacker (1940), Hewes (1947 [1973]), Walker (1967, 1973), and these estimates have been reviewed by Marshall (1977) and Hunn (1981). Based on these educated guesses, I use 500 pounds per person per year as a

reasonable traditional gross harvest rate for "River Yakima" and 400 pounds for the Nez Perce (cf. Walker 1973:56) and the Colville. Actual consumption is estimated at 80% for the edible fraction (thus 400 and 320 pounds respectively). Allowing adult males their usual 115% of the overall average, we get 8.85 and 7 pounds per adult male per week for the two subregions. If we add 5% to these totals for the "eel" harvest, we get 7.4 and 9.3 pounds per week respectively. Seasonal consumption patterns are designed to reflect the timing of anadromous fish runs. These consumption levels provided 819 and 489 calories per person per day (corrected for nutritional quality as in Hunn 1981) respectively.

1944-1947/1964-1966: Traditional families continued to utilize traditional fishing sites into the 1940's. Bonneville, Rock Island, and Grand Coulee dams on the Columbia and dams such as Rimrock on the Tieton were completed before 1944. Furthermore, commercial Columbia River salmon fisheries productivity had begun to decline by the 1920's and by 1945 was down to about 50% of the average production of the years 1880-1930 (Zucker et al. 1983:167). Traditional access restrictions at key fisheries such as The Dalles-Celilo had begun to breakdown, allowing a more even distribution of access to anadromous fisheries to members of treaty tribes. The Colville, lacking treaty-based fishing rights and affected by the total blockage to salmon migration imposed by the Grand Coulee dam, reduced their anadromous fish consumption to a much greater degree than the other groups. My estimates are as follows:

1940's/treaty:	anadromous fish/beef & pork/poultry
traditional families	80%/10%/10%
non-traditional families	60%/20%/20%
1960's/treaty	
traditional families	60%/30%/30%
non-traditional families	50%/25%/25%

1940's/non-treaty:	anadromous fish/beef & pork/poultry
traditional families	40%/15%/15%
non-traditional families	20%/40%/40%
1960's/non-treaty	
traditional families	30%/35%/35%
non-traditional families	20%/40%/40%

OTHER FISH: Most important among non-anadromous fish were suckers (late winter, early spring), trout (summer, early fall), and whitefish (winter). I estimate that such fish in total represented 10% of the maximal salmonid harvest, i.e., 50 pounds per person per year. This comes to 0.9 pounds per week for an adult male. It is likely but not certain that such fish were harvested in greater quantity where salmon were less readily available. I have thus allocated twice the "River Yakima" amount to the Nez Perce and Colville. This is reduced as follows:

1940's:	non-anadromous fish/beef & pork/poultry
traditional families	60%/20%/20%
non-traditional families	40%/30%/30%
1960's	
traditional families	40%/30%/30%
non-traditional families	20%/40%/40%

SHELLFISH: Though archaeological evidence suggests a substantial dietary role for Columbia River "mussels" (Lyman 1984), ethnohistoric and ethnographic sources suggest a minor role as a winter famine buffer. I estimate 0.5 pounds per adult male per week during the winter season only. This is reduced to zero by the 1940's, replaced presumably by beef & pork and poultry.

BLACK TREE "MOSS": This traditional food item might best be included under the heading "exposed vegetables." It was not--as has sometimes been claimed--a "famine food." Rather it was and is considered a delicacy or dessert (though now sweetened with sugar). It is difficult to harvest and to prepare and thus relatively small quantities were consumed. One ounce per adult male per week would represent a total annual consumption of 3 pounds. By 1944-1947 that quantity would likely have been reduced by 50% for traditionalist families and to 10% for others and to 25% and 0% respectively by 1964-1966. It would have been replaced by sugar and commercial sweets.

WATER: This is of course an essential nutrien also. I do not know what significance it has for radioactive exposure. In the 1940's traditional "River Yakima" families still took a significant fraction of their drinking and cooking water from the Columbia River, though by the 1960's this exposure was substantially reduced by virtue of the loss of fisheries inundated by The Dalles, McNary, and John Day dams.

POSTSCRIPT: As noted above, I attempted to assign certain pieces of the 2400 calorie "pie" to each category of traditional food. In retrospect I find my estimates to have overshot the mark by some 11 to 15%:

food category (standard)	cal/edible lb.	cal/person/day
greens (rhubarb)	72	7.75
roots (Hunn 1981)	453	1483.33
grains (filbert/pinyon)	2880	123.01
fruits (blueberries)	259	110.62
eggs (goose)	467/egg	16.62
game (lean venison)	572	122.15/244.30
wild birds (pheasant/quail)	685	29.26/58.52
anadromous fish (Hunn 1981)	733 x .08	818.78 (main stem)
	733 x .06	488.84 (tributary)
other fish (brook trout)	458	58.68/117.36
shellfish (clam/mussel)	400	7.12
black tree "moss"	---	---
TOTAL CALORIES/PERSON/DAY		2777.32/2657.47
PERCENTAGE OF 2400		115%/111%

*NOTE: When two totals are given separated by a slash, they are for main stem Columbia (i.e., "River Yakima") groups first, followed by tributary or up river (i.e., Nez Perce, Colville) groups.

To correct for this over estimation simply reduce all estimates by the appropriate percentage. The difference between main stem and tributary groups could have been eliminated by trade of by miinor adjustments in the allocations. There is no

reason to think that lower main stem residents consumed more calories than those on tributaries and upriver.

Evidence of highly elevated rates of diet-related illness, such as diabetes, are indicative of excess caloric intakes in modern diets. I note that no provision was made in the non-traditional food categories for refined sugar, which is no doubt a very substantial source of calories in 1960's diets and not inconsequential in the 1940's. I leave the detailed determination of non-traditional dietary patterns to others.

REFERENCES CITED

Craig, Joseph, and R. L. Hacker 1940. "The History and Development of the Fisheries of the Columbia River." United States Bureau of Fisheries Bulletin No. 32.

Hewes, Gordon 1973 [1947]. "Indian Fisheries Productivity in Pre-Contact Times in the Pacific Salmon Area." Northwest Anthropological Research Notes 7:133-55. Originally Ph.D. dissertation, University of California, Berkeley (1947).

Hunn, Eugene S. 1981. "On the Relative Contribution of Men and Women to Subsistence Among Hunter-Gatherers of the Columbia Plateau: A Comparison with Ethnographic Atlas Summaries." Journal of Ethnobiology 1:124-34.

Keely, P. B., C. S. Martinsen, E. S. Hunn, and H. H. Norton. 1982. "Composition of Native American Fruits in the Pacific Northwest." Journal of the American Dietetic Association 81:568-72.

Lee, Richard B. 1979. Men, Women, and Work in a Foraging Society. Cambridge University Press, Cambridge, England.

Lyman, R. Lee. 1984. "A Model of Large Freshwater Clam Exploitation in the Prehistoric Southern Columbia Plateau Culture Area." Northwest Anthropological Research Notes 18:97-107.

Marshall, Alan Gould. 1977. "Nez Perce Social Groups: An Ecological Interpretation." Ph.D. dissertation, Washington State University, Pullman.

Norton, H. H., E. S. Hunn, C. S. Martinsen, and P. B. Keely. 1984. "Vegetable Food Products of the Foraging Economies of

the Pacific Northwest." Ecology of Food and Nutrition 14:219-28.

Turner, Nancy J., Randy Bouchard, and Dorothy I. D. Kennedy. 1980. "Ethnobotany of the Okanagan-Colville Indians of British Columbia." British Columbia Provincial Museum, Occasional Paper No. 21.

Walker, Deward E., Jr. 1967. "Mutual Cross-Utilization of Economic Resources in the Plateau: An Example from Aboriginal Nez Perce Fishing Practices." Washington State University, Laboratory of Anthropology, Report of Investigations No. 41.

Walker, Deward E., Jr. 1973. American Indians of Idaho. Volume 1: Aboriginal Cultures. Anthropological Monographs, University of Idaho, No. 2.

Watt, B. K., and A. L. Merrill. 1963. Composition of Foods. Agricultural Handbook No. 8. U. S. D. A., Washington, D. C.

Zucker, Jeff, Kay Hummel, and Bob Høgfoss. 1983. Oregon Indians: Culture, History, and Current Affairs: an Atlas and Introduction. Western Imprinnts, Oregon Historical Society, Portland.

Native American Food Consumption Estimates

Tribe "RIVER YAKIMA"

AGE
- ☐ Newborn (0-1 year)
- ☐ 1 - 4 years
- ☐ 5 - 9 years
- ☐ 10 - 14 years
- ☐ 15 - 19 years
- ☒ Adult (20+ years)

SEX
- ☒ Male
- ☐ Female

TIME PERIOD
- ☒ 1800 AD
- ☐ 1944-1947
- ☐ 1964-1966

TRADITIONAL FOOD CONSUMED	Spring Min	Spring Avg	Spring Max	Summer Min	Summer Avg	Summer Max	Fall Min	Fall Avg	Fall Max	Winter Min	Winter Avg	Winter Max
Exposed Vegetables (lbs/wk)												
FRESH	2	3	4		ø			ø			ø	
STORED		ø			ø			ø			ø	
Other Vegetables (lbs/wk)												
FRESH		20			10			3			1	
STORED		3			13			20			22	
Grains/Seeds (lbs/wk)												
FRESH		ø			ø			0.4			ø	
STORED		ø			ø			0.4			0.4	
Fruits/Berries (lbs/wk)												
FRESH		ø			4			2			ø	
STORED		2			ø			2			2	
Wild bird eggs (geese)												
NUMBER/WK		1			ø			ø			ø	
Game (lbs/wk)												
FRESH		0.5			ø			0.5			0.5	
STORED		1.5			ø			1.5			1.5	
Wild birds (lbs/wk)												
FRESH		0.3			0.3			0.3			0.3	
STORED												
Fish, anadromous (lbs/wk)												
FRESH		4.7			9.3			4.7			ø	
STORED		4.6			ø			4.6			9.3	
Fish, other (lbs/wk)												
FRESH		0.9			0.9			0.6			0.3	
STORED		ø			ø			0.3			0.6	
Shellfish (lbs/wk)												
FRESH		ø			ø			ø			0.5	
STORED		ø			ø			ø			ø	
Black Tree Moss (oz/wk)												
STORED		1			1			1			1	
Water (qts/wk)		21			28			21			14	

Native American Food Consumption Estimates

Tribe Nez Perce

AGE
- ☐ Newborn (0-1 year)
- ☐ 1 - 4 years
- ☐ 5 - 9 years
- ☐ 10 - 14 years
- ☐ 15 - 19 years
- ☒ Adult (20+ years)

SEX
- ☒ Male
- ☐ Female

TIME PERIOD
- ☒ 1800 AD
- ☐ 1944-1947
- ☐ 1964-1966

TRADITIONAL FOOD CONSUMED	Spring Min	Spring Avg	Spring Max	Summer Min	Summer Avg	Summer Max	Fall Min	Fall Avg	Fall Max	Winter Min	Winter Avg	Winter Max
Exposed Vegetables (lbs/wk)												
FRESH	2	3	4									
STORED												
Other Vegetables (lbs/wk)												
FRESH		20			10			3			1	
STORED		3			13			20			22	
Grains/Seeds (lbs/wk)												
FRESH								0.4				
STORED								0.4			0.4	
Fruits/Berries (lbs/wk)												
FRESH					4			2				
STORED		2						2			2	
Wild bird eggs (goose)												
NUMBER/WK		1										
Game (lbs/wk)												
FRESH		1.0						1.0			1.0	
STORED		3.0						3.0			3.0	
Wild birds (lbs/wk)												
FRESH		0.6			0.6			0.6			0.6	
STORED												
Fish, anadromous (lbs/wk)												
FRESH		3.7			7.4			3.7				
STORED		3.7						3.7			7.4	
Fish, other (lbs/wk)												
FRESH		1.8			1.8			1.2			0.6	
STORED								0.6			1.2	
Shellfish (lbs/wk)												
FRESH											0.5	
STORED												
Black Tree "Moss" (oz/wk)		1			1			1			1	
STORED												
water (qts./wk)		21			28			21			14	

Native American Food Consumption Estimates

Tribe "River Yakima"

AGE	SEX	TIME PERIOD
☐ Newborn (0-1 year)	☒ Male	☒ 1944-1947
☐ 1 - 4 years	☐ Female	☐ 1964-1966
☐ 5 - 9 years		
☐ 10 - 14 years		
☐ 15 - 19 years		
☒ Adult (20+ years) Traditionalist (Max); Non-traditionalist (Min)		

TRADITIONAL FOOD CONSUMED	Spring			Summer			Fall			Winter		
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
Exposed Vegetables (lbs/wk)												
FRESH	0.6		2.4	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–
Other Vegetables (lbs/wk)												
FRESH	4		12	2		6	0.6		1.8	0.2		0.6
STORED	0.6		1.8	2.4		7.8	4		12	44		13.2
Grains/Seeds (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–
Fruits/Berries (lbs/wk)												
FRESH	–		–	1.2		2.4	0.6		1.2	–		–
STORED	0.6		1.2	–		–	0.6		1.2	0.6		1.2
Wild bird eggs												
NUMBER/WK	–		–	–		–	–		–	–		–
Game (lbs/wk)												
FRESH	0.1		0.3	–		–	0.1		0.3	0.1		0.3
STORED	0.3		0.9	–		–	0.3		0.9	0.3		0.9
Wild birds (lbs/wk)												
FRESH	–		0.15	–		0.15	–		0.15	–		0.15
STORED	–		–	–		–	–		–	–		–
Fish, anadromous (lbs/wk)												
FRESH	2.82		3.76	5.58		7.44	2.82		3.76	–		–
STORED	2.76		3.68	–		–	2.76		3.68	5.58		7.44
Fish, other (lbs/wk)												
FRESH	0.36		0.54	0.36		0.54	0.24		0.36	0.24		0.18
STORED	–		–	–		–	0.12		0.18	0.12		0.36
Shellfish (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–

Black Tree "Moss" (oz/wk)

STORED	0.1		0.5	0.1		0.5	0.1		0.5	0.1		0.5

Native American Food Consumption Estimates

Tribe: Colville

AGE
- ☐ Newborn (0-1 year)
- ☐ 1 - 4 years
- ☐ 5 - 9 years
- ☐ 10 - 14 years
- ☐ 15 - 19 years
- ☒ Adult (20+ years)

SEX
- ☒ Male
- ☐ Female

TIME PERIOD
- ☒ 1800 AD
- ☐ 1944-1947
- ☐ 1964-1966

TRADITIONAL FOOD CONSUMED	Spring Min	Spring Avg	Spring Max	Summer Min	Summer Avg	Summer Max	Fall Min	Fall Avg	Fall Max	Winter Min	Winter Avg	Winter Max
Exposed Vegetables (lbs/wk)												
FRESH	2	3	4									
STORED												
Other Vegetables (lbs/wk)												
FRESH		20			10			3			1	
STORED		3			13			20			22	
Grains/Seeds (lbs/wk)												
FRESH								0.4				
STORED								0.4			0.4	
Fruits/Berries (lbs/wk)												
FRESH					4			2				
STORED		2						2			2	
Wild bird eggs (goose)												
NUMBER/WK		1										
Game (lbs/wk)												
FRESH		1.0						1.0			1.0	
STORED		3.0						3.0			3.0	
Wild birds (lbs/wk)												
FRESH		0.6			0.6			0.6			0.6	
STORED												
Fish, anadromous (lbs/wk)												
FRESH		3.7			7.4			3.7				
STORED		3.7						3.7			7.4	
Fish, other (lbs/wk)												
FRESH		1.8			1.8			1.2			0.6	
STORED								0.6			1.2	
Shellfish (lbs/wk)												
FRESH											0.5	
STORED												
Black Tree "Moss" (oz/wk)					1			1			1	
STORED		1										
Water (qts./wk)		21			28			21			14	

Native American Food Consumption Estimates

Tribe Nez Perce

AGE	SEX	TIME PERIOD
☐ Newborn (0-1 year)	☒ Male	☒ 1944-1947
☐ 1 - 4 years	☐ Female	☐ 1964-1966
☐ 5 - 9 years		
☐ 10 - 14 years		
☐ 15 - 19 years		
☒ Adult (20+ years)	Traditionalist (Max); Non-traditionalist (Min)	

TRADITIONAL FOOD CONSUMED	Spring			Summer			Fall			Winter		
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
Exposed Vegetables (lbs/wk)												
FRESH	0.6		2.4	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–
Other Vegetables (lbs/wk)												
FRESH	4		12	2		6	0.6		1.8	0.2		0.6
STORED	0.6		1.8	2.4		7.8	4		12	4.4		13.2
Grains/Seeds (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–
Fruits/Berries (lbs/wk)												
FRESH	–		–	1.2		2.4	0.6		1.2	–		–
STORED	0.6		1.2	–		–	0.6		1.2	0.6		1.2
Wild bird eggs												
NUMBER/WK	–		–	–		–	–		–	–		–
Game (lbs/wk)												
FRESH	0.2		0.6	–		–	0.2		0.6	0.2		0.6
STORED	0.6		1.8	–		–	0.6		1.8	0.6		1.8
Wild birds (lbs/wk)												
FRESH	–		0.3	–		0.3	–		0.3	–		0.3
STORED	–		–	–		–	–		–	–		–
Fish, anadromous (lbs/wk)												
FRESH	2.22		2.96	4.44		5.92	2.22		2.96	–		–
STORED	2.22		2.96	–		–	2.22		2.96	4.44		5.92
Fish, other (lbs/wk)												
FRESH	0.72		1.08	0.72		1.08	0.48		0.72	0.48		0.36
STORED	–		–	–		–	0.24		0.36	0.24		0.72
Shellfish (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–

Black Tree "Moss" (oz/wk)

STORED 0.1 0.5 0.1 0.5 0.1 0.5 0.1 0.5

Native American Food Consumption Estimates

Tribe COLVILLE

AGE	SEX	TIME PERIOD
☐ Newborn (0-1 year)	☒ Male	☒ 1944-1947
☐ 1 - 4 years	☐ Female	☐ 1964-1966
☐ 5 - 9 years		
☐ 10 - 14 years		
☐ 15 - 19 years		
☒ Adult (20+ years)	Traditionalist (Max); Non-traditionalist (Min)	

TRADITIONAL FOOD CONSUMED	Spring Min	Spring Avg	Spring Max	Summer Min	Summer Avg	Summer Max	Fall Min	Fall Avg	Fall Max	Winter Min	Winter Avg	Winter Max
Exposed Vegetables (lbs/wk)												
FRESH	0.6		2.4			–	–		–	–		–
STORED	–			–		–	–		–	–		–
Other Vegetables (lbs/wk)												
FRESH	4		12	2		6	0.6		1.8	0.2		0.6
STORED	0.6		1.8	2.4		7.8	4		12	4.4		13.2
Grains/Seeds (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–
Fruits/Berries (lbs/wk)												
FRESH	–		–	1.2		2.4	0.6		1.2	–		–
STORED	0.6		1.2	–		–	0.6		1.2	0.6		1.2
Wild bird eggs												
NUMBER/WK	–		–	–		–	–		–	–		–
Game (lbs/wk)												
FRESH	0.2		0.6	–		–	0.2		0.6	0.2		0.6
STORED	0.6		1.8	–		–	0.6		1.8	0.6		1.8
Wild birds (lbs/wk)												
FRESH	–		0.3	–		0.3	–		0.3	–		0.3
STORED	–		–	–		–	–		–	–		–
Fish, anadromous (lbs/wk)												
FRESH	0.74		1.48	1.48		2.96	0.74		1.48	–		–
STORED	0.74		1.48	–		–	0.74		1.48	1.48		2.96
Fish, other (lbs/wk)												
FRESH	0.72		1.08	0.72		1.08	0.48		0.72	0.48		0.36
STORED	–		–	–		–	0.24		0.36	0.24		0.72
Shellfish (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–

Black Tree "Moss" (oz/wk)

STORED	0.1		0.5	0.1		0.5	0.1		0.5	0.1		0.5

Native American Food Consumption Estimates

Tribe "River Yakima"

AGE
- ☐ Newborn (0-1 year)
- ☐ 1 - 4 years
- ☐ 5 - 9 years
- ☐ 10 - 14 years
- ☐ 15 - 19 years
- ☒ Adult (20+ years) Traditionalist (Mean); Non-traditionalist (Min.)

SEX
- ☒ Male
- ☐ Female

TIME PERIOD
- ☐ 1944-1947
- ☒ 1964-1966

TRADITIONAL FOOD CONSUMED	Spring Min	Spring Avg	Spring Max	Summer Min	Summer Avg	Summer Max	Fall Min	Fall Avg	Fall Max	Winter Min	Winter Avg	Winter Max
Exposed Vegetables (lbs/wk)												
FRESH	0.3		1.5	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–
Other Vegetables (lbs/wk)												
FRESH	2		6	1		3	0.3		0.9	0.1		0.3
STORED	0.3		0.9	1.2		3.9	2		6	2.2		6.6
Grains/Seeds (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–
Fruits/Berries (lbs/wk)												
FRESH	–		–	0.8		1.6	0.3		0.6	–		–
STORED	0.4		0.8	–		–	0.3		0.6	0.3		0.6
Wild bird eggs												
NUMBER/WK	–		–	–		–	–		–	–		–
Game (lbs/wk)												
FRESH	0.05		0.15	–		–	0.05		0.15	0.05		0.15
STORED	0.15		0.45	–		–	0.15		0.45	0.15		0.45
Wild birds (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–
Fish, anadromous (lbs/wk)												
FRESH	2.35		2.82	4.65		5.58	2.35		2.82	–		–
STORED	2.30		2.76	–		–	2.30		2.76	4.65		5.58
Fish, other (lbs/wk)												
FRESH	0.18		0.36	0.18		0.36	0.12		0.24	0.06		0.12
STORED	–		–	–		–	0.06		0.12	0.12		0.24
Shellfish (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–

Black Tree "Moss" (0.3/wk)

STORED	–	0.25	–	0.25	–	0.25	–	0.25	–	0.25

Native American Food Consumption Estimates

Tribe Colville

AGE
- ☐ Newborn (0-1 year)
- ☐ 1 - 4 years
- ☐ 5 - 9 years
- ☐ 10 - 14 years
- ☐ 15 - 19 years
- ☒ Adult (20+ years) Traditionalist (Max); Non-traditionalist (Min)

SEX
- ☒ Male
- ☐ Female

TIME PERIOD
- ☐ 1944-1947
- ☒ 1964-1966

TRADITIONAL FOOD CONSUMED	Spring Min	Spring Avg	Spring Max	Summer Min	Summer Avg	Summer Max	Fall Min	Fall Avg	Fall Max	Winter Min	Winter Avg	Winter Max
Exposed Vegetables (lbs/wk)												
FRESH	0.3		1.5	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–
Other Vegetables (lbs/wk)												
FRESH	2		6	1		3	0.3		0.9	0.1		0.3
STORED	0.3		0.9	1.2		3.9	2		6	2.2		6.6
Grains/Seeds (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–
Fruits/Berries (lbs/wk)												
FRESH	–		–	0.8		1.6	0.3		0.6	–		–
STORED	0.4		0.8	–		–	0.3		0.6	0.3		0.6
Wild bird eggs												
NUMBER/WK	–		–	–		–	–		–	–		–
Game (lbs/wk)												
FRESH	0.1		0.3	–		–	0.1		0.3	0.1		0.3
STORED	0.3		0.9	–		–	0.3		0.9	0.3		0.9
Wild birds (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–
Fish, anadromous (lbs/wk)												
FRESH	0.74		1.11	1.48		2.22	0.74		1.11	–		–
STORED	0.74		1.11	–		–	0.74		1.11	1.48		2.22
Fish, other (lbs/wk)												
FRESH	0.36		0.72	0.36		0.72	0.24		0.48	0.12		0.24
STORED	–		–	–		–	0.12		0.24	0.24		0.48
Shellfish (lbs/wk)												
FRESH	–		–	–		–	–		–	–		–
STORED	–		–	–		–	–		–	–		–

Black Tree "Moss" (oz/wk)

STORED	–		0.25	–		0.25	–		0.25	–		0.25

Native American Food Consumption Estimates

Tribe: Nez Perce

AGE
- ☐ Newborn (0-1 year)
- ☐ 1 - 4 years
- ☐ 5 - 9 years
- ☐ 10 - 14 years
- ☐ 15 - 19 years
- ☒ Adult (20+ years) Traditionalist (Max); Non-traditionalist (Min)

SEX
- ☒ Male
- ☐ Female

TIME PERIOD
- ☐ 1944-1947
- ☒ 1964-1966

TRADITIONAL FOOD CONSUMED	Spring Min	Spring Avg	Spring Max	Summer Min	Summer Avg	Summer Max	Fall Min	Fall Avg	Fall Max	Winter Min	Winter Avg	Winter Max
Exposed Vegetables (lbs/wk)												
FRESH	0.3		1.5	—		—	—		—	—		—
STORED	—		—	—		—	—		—	—		—
Other Vegetables (lbs/wk)												
FRESH	2		6	1		3	0.3		0.9	0.1		0.3
STORED	0.3		0.9	1.2		3.9	2		6	2.2		6.6
Grains/Seeds (lbs/wk)												
FRESH	—		—	—		—	—		—	—		—
STORED	—		—	—		—	—		—	—		—
Fruits/Berries (lbs/wk)												
FRESH	—		—	0.8		1.6	0.3		0.6	—		—
STORED	0.4		0.8	—		—	0.3		0.6	0.3		0.6
Wild bird eggs												
NUMBER/WK	—		—	—		—	—		—	—		—
Game (lbs/wk)												
FRESH	0.1		0.3	—		—	0.1		0.3	0.1		0.3
STORED	0.3		0.9	—		—	0.3		0.9	0.3		0.9
Wild birds (lbs/wk)												
FRESH	—		—	—		—	—		—	—		—
STORED	—		—	—		—	—		—	—		—
Fish, anadromous (lbs/wk)												
FRESH	1.85		2.22	3.70		4.44	1.85		2.22	—		—
STORED	1.85		2.22	—		—	1.85		2.22	3.70		4.44
Fish, other (lbs/wk)												
FRESH	0.36		0.72	0.36		0.72	0.24		0.48	0.12		0.24
STORED	—		—	—		—	0.12		0.24	0.24		0.48
Shellfish (lbs/wk)												
FRESH	—		—	—		—	—		—	—		—
STORED	—		—	—		—	—		—	—		—

Black Tea "Mass" (oz/wk)

STORED	—	0.25	—	0.25	—	0.25	—	0.25