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KENNETH W. CUMMINS and JOHN C. WUYCHECK

CALORIC EQUIVALENTS FOR INVESTIGATIONS IN ECOLOGICAL ENERGETICS

With 2 figures and 3 tables in the text

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INTERNATIONALE VEREINIGUNG
FÜR THEORETISCHE UND ANGEWANDTE LIMNOLOGIE

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KOMITEE FÜR LIMNOLOGISCHE METHODEN, Veröffentlichung No. 15, 1971

Caloric Equivalents for Investigations in Ecological Energetics [1]

KENNETH W. CUMMINS and JOHN C. WUYCHECK

Hickory Corners, Michigan 49060, U.S.A.

With 2 figures and 3 tables in the text

Contents

[1] The original research data reported in the tables and the technical-clerical help necessary to prepare this paper were supported by Atomic Energy Commission Contract AT (30-1)-3519 and AT (11-1)-2002.

Introduction

Since LINDEMAN (1942) exerted a synthesizing influence on trophic-dynamic theory, the tendency to utilize the calorie as a common denominator has increased steadily among ecologists. The progression has recently culminated in the equilibration of ecosystem ecology and ecological energetics (e.g. PHILLIPSON, 1966).

This equivalence intended by ecological investigators has created a demand for calorific values. Several summaries of caloric data have appeared previously (SLOBODKIN & RICHMAN, 1961; GOLLEY, 1961; STRAŠKRABA, 1968) including former unpublished versions of the present tabulation (CUMMINS, 1966, 1967). The current presentation is an attempt to expand former summaries and to indicate ecologically and taxonomically defined areas where caloric data are lacking.

Discussion of calorimetry methods

A number of problems associated with the measurement and interpretation of calorific equivalents need to be stressed in order to place the present paper in proper context.

The total theoretical range of organismic caloric values is 5400 cal/ash-free gm, from an average for pure carbohydrate of 4100 to 9500 for fats. However, actual organisms would be expected to exhibit only a portion of this range with an average closer to that for protein (5100 cal/ash-free gm). Assuming that most field sampling programs in ecosystem analysis do well to operate at a variance of less than 10%, only differences of 500 to 1000 calories per gram would be considered significant in most ecosystem studies at present. Calorific variations of lesser magnitude probably would represent reliable differences in detailed energy budget studies at the population level. Therefore, given the large variance with which ecosystem ecologists are often forced to deal, it may be more realistic at present to use a median caloric value, or a grand mean, or producer and consumer means.

Within the range of calorific values determined for whole individuals of a given species, variables such as season of collection, life history stage, sex, reproductive condition and nutritional history assume considerable importance. Of particular interest, with regard to seasonal differences, are the extremely high values of premigratory birds resulting from the storage of large fat reserves. Life history stage is also of importance relative to lipid reserves, for example the elaboration of fat bodies in prepupal insects.

Fruit-bearing producers, spore-bearing microconsumers and egg-bearing animal consumers usually yield the highest caloric content for a given species. Male organisms frequently show lower values than females, again related to differential fat reserves.

The diet of animals prior to collection for calorie determinations is of significance not only because of its relation to the condition of fat stores, but also since most literature values for whole individuals include the gut contents of specimens. Special considerations are necessary in this case. For example, an investigator interested in the caloric content of a prey organism as part of a food chain study undoubtedly should use values which include gut contents-at least until assimilation experiments demonstrate the material not to be utilized by the next trophic level. In other words, in calorimetry, just as in many other facets of ecosystem studies, it is important to distinguish between tissue and gut phenomena.

In addition to variability associated with the nature of the material analyzed, there is the problem of methodology; standard methods have yet to be achieved. The four most commonly employed procedures are: 1. various models of oxygen bomb calorimeters manufactured by the Parr Instrument Company (Moline, Illinois, U.S.A. 61265); 2. the Phillipson-type microbomb calorimeter (PHILLIPSON, 1964) or its modified form supplied by Gentry-Wiegert Instruments (313 Silver Bluff Road, Aiken, South Carolina, U.S.A. 29801); 3. wet dichromate oxidation as described by MACIOLEK (1962); and, 4. calculation from protein (usually estimated from nitrogen determinations), fat (usually measured by soxhlet ether extraction) and carbohydrate (usually obtained by difference) content, using the caloric equivalents given above (e.g. BIRGE & JUDAY, 1922; SPOEHR & MILNER, 1949; KETCHUM & REDFIELD, 1949; VINOGRADOV, 1953). A miniature adiabatic oxygen bomb of the "Parr-type" developed by MCEWAN & ANDERSON (1955) has been used by a few investigators (see Table 3).

Although considerable disagreement is to be expected, the authors' recommendations are summarized in Fig. 1. Pretreatment techniques need to be standardized. Since a number of suitable instruments are available for making the actual caloric determinations, the selection of an instrument is dependent primarily on the range of sample sizes to be combusted. Because of the assumptions that must be made when caloric values are calculated from protein, fat and carbohydrate determinations, an equally fruitful approach may be to assign an average caloric value, from Table 2, for the ecological or taxonomic group in question.

Concerning the problem of expressing calorific values on a per gram wet, dry or ash-free dry weight basis, it seems that all three are required, at least for certain kinds of studies. Since most ecologists are presently concerned with converting biomass data to calorific equivalents, the most useful form of the caloric data is that which conforms to the most frequently employed form of the biomass data. This is clearly dry weight, until ash-free (i.e. organic) weight values are more frequently utilized. However, there is no doubt that comparisons of the caloric content of organisms, for example along phylogenetic lines, should be made on an ash-free dry weight basis.

Dry weights are most frequently determined after oven drying at between 80 and 105° C and storage in a desiccator, both treatments being of a least 24-hour duration. As shown in Fig. 1, we recommend standardization of oven drying at 105° C. but if the material contains more than 1% organics volatilized

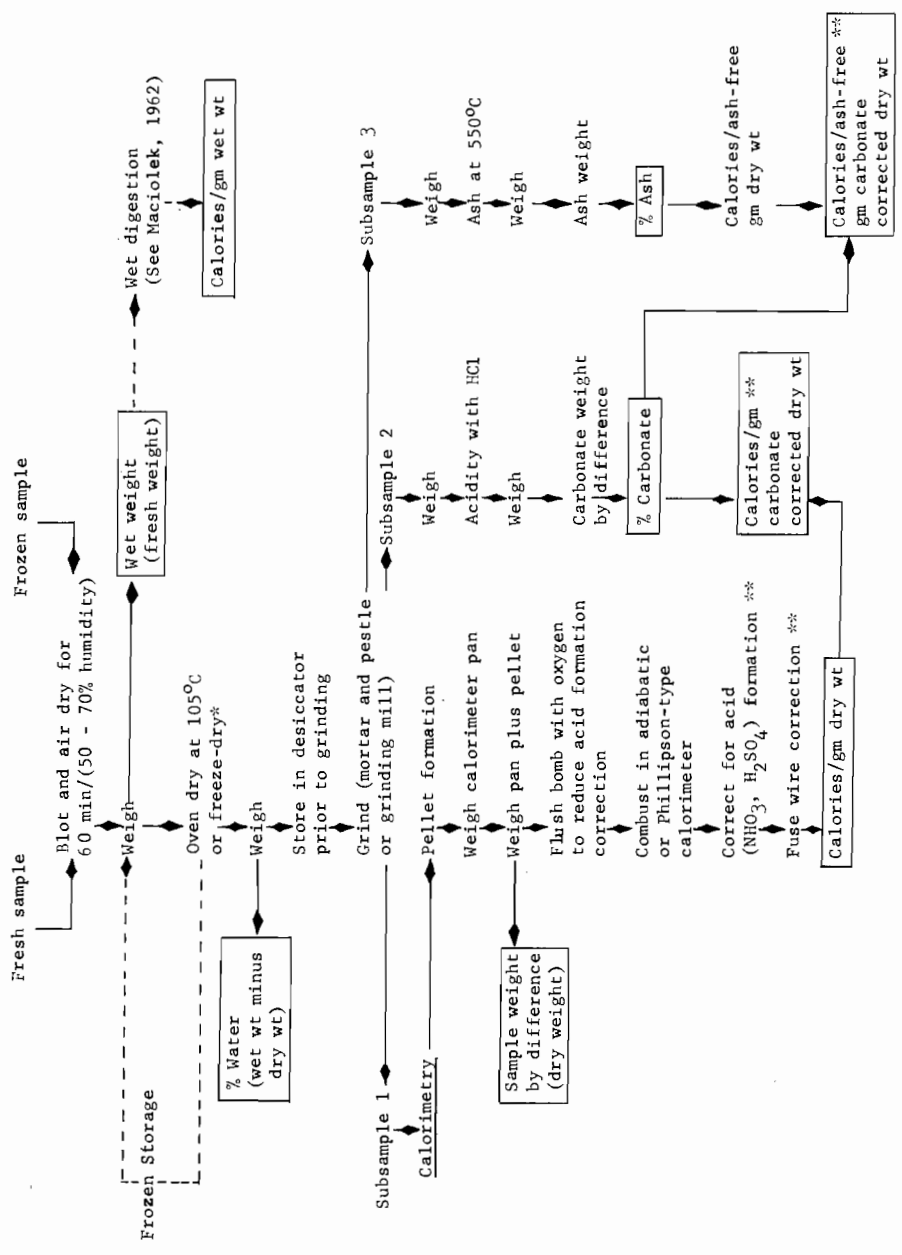

Fig. 1. Methods for determining caloric values (per gram wet, dry and ash-free dry weight) with recommended corrections. *Freeze drying, oven drying at 50° C (or air drying for very small samples) followed by desiccation over P_2O_5 is recommended especially if the material is known to have a high lipid content or to contain greater than 5% organics volatilized on drying. **In many cases these corrections are negligible. Calcium carbonate content can be determined by combusting subsamples at 950° C.

on drying, freeze drying is recommended. Best results are obtained if the material to be combusted is compressed into a pellet. Such pellets, stored in a desiccator until use, should be weighed just prior to combustion (balance chamber should be supplied with desiccant). To avoid loss of material in transferring the weighed pellet to the bomb chamber, the most satisfactory procedure is to weigh the platinum combustion cup without the pellet and then with the pellet. Then the cup plus pellet is placed in the holder within the chamber and the fuse wire positioned.

The large variations associated with wet weight (i.e. fresh weight or as used by some investigators, air dry weight) determinations and the lack of information on % of water content for most organisms render this the least desirable form for calorific data. Nevertheless, in certain growth (production) studies in which the same individual must be weighed at intervals, wet weight caloric conversion values are necessary.

Since fuse wire contamination of the residual sample is always a problem in bomb calorimetry, ash values should be determined on separate samples by combustion in a muffle furnace at 550° C for three hours. As PAINE (1964, 1966) has pointed out, high inorganic salt and hydrated skeletal material can be sources of errors in both calorimetry and ashing. Aside from the problem of furnace accuracy (PAINE, 1964), temperatures between 500 and 900° C can cause weight loss due to the breakdown of carbonates ($MgCO_3$ at 350° C, $CaCO_3$ at 898° C). If more than 25% of the dry weight of the organism is carbonate a correction is necessary for endothermic reactions (PAINE, 1966) occurring during combustion in the calorimeter. The empirically determined correction was 0.14 cal/mg $CaCO_3$ (PAINE, 1966). Although most organisms can be expected to contain less than 25% carbonates, for greatest accuracy the correction should be made based on independent determinations of carbonate content by combustion of subsamples at 925° C.

A correction for acid formation (HNO_3 and H_2SO_4) during combustion in the calorimeter is also desirable (Parr Instrument Co.; GOLLEY, 1961) although in many cases it is negligible.

Of course, it is always desirable to avoid utilization of benzoic acid, membrane filter or some other material of known or previously determined caloric content as a "carrier". However, if the sample size is of necessity below the accurate range for the Phillipson-type calorimeter (< 5 mg), there may be no alternative. For this reason, caloric values for some miscellaneous materials have been included in Table 3. If the material is greater than 30% ash it will be difficult to obtain complete combustion. In such cases a high energy carrier such as mineral oil is necessary in order to obtain reliable values.

Regardless of the problems associated with calorimetry, it seems desirable to continue to take stock of the caloric values obtained thus far. In most instances, these values carry with them specific data as to the nature of the material burned and some estimate, such as standard deviation, of the variation encountered within a given set of samples. Comparison of caloric values obtained for the same species by different investigators should allow conclusions to be drawn concerning

seasonal, habitat, dietary and other differences that might be expected. Thus, if either extreme prevails, that is, very narrow ranges cutting across vastly different taxonomic and ecological groupings or wide ranges of variation even within the same species, we will have the data from which to select an approach that will yield maximum benefit to ecosystem research.

Discussion of tabular material

The data certainly indicate the desirability of using separate values for producers (mean from Table 1 = 4685), microconsumers (mean = 4958) and macroconsumers (mean = 5821). The values for detritus, which include both the organic substrates and the microflora (and, undoubtedly, certain microfaunal elements also), do not differ very much from the primary producer values (500 calorie/ash-free gm difference). Although there is only approximately a 200 calorie difference between the aquatic and terrestrial invertebrate means, over 1200 calories separate the aquatic and terrestrial vertebrate means. This results from the heavy dominance of low fish values in the former and of high bird values in the latter.

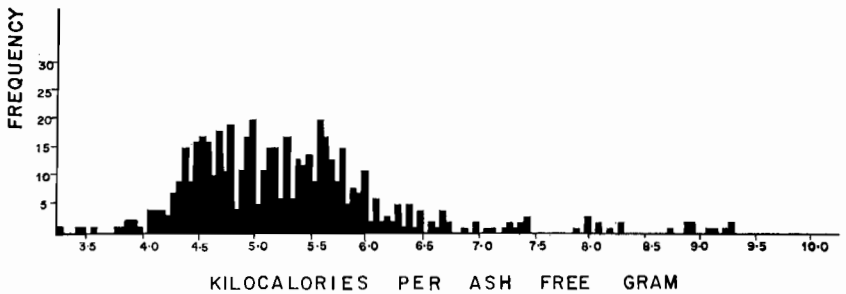

Fig. 2. Frequency distribution per ash-free gram dry weight caloric values for organisms (from Table 1).

A frequency distribution of the species caloric values, on a per ash-free gram basis, has been plotted in Fig. 2. A similar presentation of calorific data by SLOBODKIN & RICHMAN (1961) showed a distribution skewed in the direction of lower caloric values. The authors related such a distribution to maximization of progeny output but only sporadic selection for high energy content per unit weight. Fig. 2 shows a skewed distribution between the range of 3300 — 9400 calories/ash-free gram. This sort of distribution would be expected given the predominance of plant values in the data that were plotted.

Obviously the tabulation is not complete, particularly since many data undoubtedly exist in theses and manuscripts not yet brought to our attention. We wish to gratefully acknowledge the assistance of a great many ecologists throughout the world who supplied data for inclusion in Table 3 and brought published and unpublished values to our attention. We are particularly grateful

for the helpful suggestions made by Drs. R. T. PAINE, R. G. WIEGERT, R. G. WETZEL, W. OHLE and V. SLÁDEČEK.

The data in Tables 1—3 have been organized according to categories intended to be of maximum use to ecosystem ecologists. The primary organization is according to trophic levels, the secondary organization according to habitat. Within secondary categories, the data are organized by taxonomic grouping down to the family level. When generic and specific designations were available, they have been included along with common names. Mean values have been summarized in Tables 1 and 2. These are not "true means" since entries from Table 3 were averaged rather than individual determinations. The outline of the tabular presentations is as follows:

Primary Producers
- Aquatic
- Terrestrial

Microconsumers
- Aquatic
- Terrestrial
- Detritus (microconsumers plus substrate)
  - Aquatic
  - Terrestrial

Macroconsumers
- Aquatic
- Terrestrial

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Address of the authors:

Dr. KENNETH W. CUMMINS and JOHN C. WUYCHECK, W. K. Kellogg Biological Station, Michigan State University, Hickory Corners, Michigan 49060, U.S.A.

Tables 1—3

Table 1. Grand mean caloric values for organisms, arranged by trophic level, habitat and taxonimic category. Notations are those used in all 3 tables; see notes following Table 3. (Total sample number minimal since for those cases in which sample number was not given unity was used.)

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Primary Producers	4135	1070	342	4681	769	255				
Aquatic (Grand Mean)	3482	502	126	4639	410	126				
Algae	3277	396	93	4628	359	89	611	171	40	1
Chlorophyta	3850	89	22	4780	55	15	847	22	5	1
Chrysophyta	3814	9	3	5310	4	2				1
Phaeophyta	3056	127	25	4496	120	25	459	81	15	1
Rhodophyta	3170	120	39	4582	120	39	666	68	20	1
Cyanophyta	1367	46	3	4882	53	6				1
Mixed Algae	4477	5	1	4669	5	1				1
Periphyton				4520	2	1				1
Bryophyta				4303	7	4				3a
Pteridophyta				4440	1	1				
Spermatophyta	4062	106	33	4716	43	32				
Angiospermae										
Monocotyledoneae	4099	101	30	4770	32	24				5b, 6a, 5a, 5c, 5d, 8d, 8b, 5f, 8a, 5p, 5m, 5l, 5k
Dicotyledoneae	3695	5	3	4555	11	8				5a, 5f, 6a
Terrestrial (Grand Mean)	4516	568	216	4758	359	115				
Eumycetes	3856	2	2							2b

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Bryophyta				4458	12	6				3a, 3d
Lichenes				4324		9				3b
Pteridophyta				4609		4				3a
Spermatophyta	4539	566	204	4824	164	96				
Gymnospermae	6005	29	8	5729	11	4				4f, 4b, 4h, 4i
Angiospermae	4479	537	196	4785	153	92				
Monocotyledoneae	4365	267	61	4580	16	8				51, 5c, 8c, 8b, 5a, 5h, 5k, 5b, 6a, 5m, 5g
Dicotyledoneae	4558	258	125	4879	137	70				5m, 51, 5c, 6a, 8b, 5a, 5b, 5d, 5k, 8c, 5f, 5o, 5j, 5i, 5g, 7a, 7d, 7e, 8a, 8e, 6b, 6d, 6c
Alpine Vegetation (Grand $\bar{X}$)				4383	173	12				5b, 5g, 5c, 5n
Mixed Woodland				4719	10	2				5b
Old field Vegetation	4189	22	10							5b, 5g
Microconsumers										
Aquatic	4713	8	2	4958	8	2				1
Detritus	4414	141	44	4885	264	52				
Aquatic	4422	111	38	5168	111	38	6243	81	27	5g, 6a, 5o
Terrestrial	4371	30	6	4117	153	14				5b, 22d, 22e, 22g, 22c

Table 1

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Macroconsumers (Grand Mean)	4953	1061	357	5821	765	298	1093	232	72	
Aquatic (Grand Mean)	4301	631	155	5465	524	139	672	127	47	
Invertebrates (Grand Mean)	4229	600	142	5470	514	135	635	125	45	
Protozoa				5938	1	1				1
Porifera	1295	6	1	6475	4	1				1, 9a
Platyhelminthes				6332	3	2	1330	1	1	9a
Coelenterata	2886	2	1	5882	2	2	494	1	1	9b
Mollusca	3120	54	16	5492	163	20	480	17	6	9b, 9a, 16a, 10a
Annelida	3910	77	22	4700	1	1	645	32	13	9a, 10a
Echinodermata	2020	20	8				351	25	8	9a
Arthropoda	4726	441	94	5445	339	107	792	49	16	9a, 10c, 10k, 10l, 10m, 9i, 10f, 10g, 16f, 16g, 10o, 10p, 10h, 10e, 10d, 10b, 12g, 11a, 16b, 14a, 10a, 9f, 11b, 9c, 9d, 9e, 13d, 13e, 13f, 13l, 13i, 13u, 10u, 10s, 11d, 16a, 16h, 13a, 10i, 13c, 13x, 10v, 13g, 12a
Brachiopoda				4397	1	1				
Vertebrates				5296	10	4				
Chondrichthyes (*R. orinacea*) eggs				5600	1	1				16a
Osteichthyes	5086	31	13	5296	10	4	1493	2	2	9a, 16a, 16e, 10t, 10d
Terrestrial (Grand Mean)	5453	430	202	6099	243	167	1884	105	25	
Invertebrates	5274	224	93	5673	157	85	2008	2	5	

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Platyhelminthes				5684	1	1				9a
Annelida	4569	3	2	5628	1	1	782	1	1	9a
Arthropoda	5289	221	91	5673	155	83	2315	1	4	10a, 9a, 16a, 13d, 13a, 13f, 13g, 13h, 11a, 10c, 12f, 13e, 13k, 10n, 10r, 16l, 16j, 15a, 15b, 15c, 15d, 15e, 15f, 15g, 15h, 17b, 17c, 17d, 12a, 16a, 13m, 13n, 13o, 13p, 13q, 13r, 13s, 13t, 22a, 12d, 12e, 10v
Vertebrates	5606	206	109	6542	86	82	1853	103	20	16d, 13w, 31a, 16a, 3b, 20a, 20d, 20e, 20g, 20b, 20c, 20f, 20h, 10a, 20i, 20j, 20l, 20m, 20k, 18e, 18f, 22b, 11a, 9g, 16k, 10c

Table 1

Table 2. Mean caloric values summarized at familial taxonomic level and arranged by trophic and habitat designation (see notes for Tables 1 and 3).

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Aquatic										
Algae	3277	396	93	4628	359	89	611	171	40	
Chlorophyta	3850	89	22	4780	55	15	847	22	5	
Volvocales										1
Chlamydomonadaceae	5289	12	1							1
Volvocaceae				4969	1	1				1
Ulotrichales										
Ulotrichaceae	5296	6	1							
Ulvales										
Ulvaceae	3937	26	6	4885	26	6	1655	10	2	1
Oedogoniales										
Oedogoniaceae										
Cladophorales	1134	8	1	4036	8	1				1
Cladophoraceae	2600	10	2	4955	10	2	330	5	1	1
Chlorococcales	4365	20	9							
Oocystaceae	5120	9	3	5287	1	1				1
Scenedesmaceae	5373	3	3							1
Zygnemataceae	3327	7	2							1
Mixed epiphytic stream (algae)	1150	1	1							1

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Siphonales										
Codiaceae	2620	6	1	4520	6	1	180	6	1	
Charales										
Characeae	2255	1	1	4554	3	3	415	1	1	
Chrysophyta										1
Bacillariophyceae	3814	9	3	5310	4	2				1
Phaeophyta	3056	127	25	4496	120	25	459	81	15	1
Ectocarpales	3470	7	2	4625		2				
Ectocarpacae	3820	2	1	5090	2	1				1
Ralfsiaceae	3120	5	1	4160	5	1				1
Chordariales										
Elachistaceae	3920	2	1	5160	2	1				1
Desmarestiales										
Desmarestiaceae	3205	9	2	4445	9	2	290	3	1	1
Dictyosiphonales	2420	7	3	4453	7	3				
Punctariaceae	2985	5	2	4890	5	2				1
Asperococcaceae	1290	2	1	3580	2	1	80	2	1	1
Laminariales	3019		15	4436		15	475		11	
Laminariaceae	2923	10	3	4380	10	3	650	6	1	1

Table 2

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Lessoniaceae	2987	40	9	4440	40	9	430	37	8	1
Alariaceae	3210	18	3	4480	18	3	570	13	2	1
Fucales										
Fucaceae	3290	20	2	4605	20	2	640	20	2	1
Rhodophyta	3170	120	39	4582	120	39	666	68	20	1
Bangiales										
Bangiaceae	4307	8	3	4877	8	3	590	6	2	1
Gelidiales										
Gelidiaceae	4400	2	1	5000	2	1	1410	2	1	1
Cryptonemiales										
Corallinaceae	2475	45	14	4323	45	14	700	10	5	1
Gigartinales										
Gigartinaceae	3368	30	4	4315	30	4	740	30	4	1
Rhodymeniales										
Rhodymeniaceae	2980	1	1	4810	1	1	590	1	1	1
Ceramiales	3451		16	4779		16	526		7	
Delesseriaceae	3615	7	2	5170	7	2	470	5	1	1
Rhodomelaceae	3427	27	14	4723	27	14	535	14	6	1

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Cyanophyta										1
Myxophyceae	1367	46	3	4882	53	6				1
Mixed algal types	4477	5	1	4669	5	1				1
Periphyton				4520	2	1				
Bryophyta				4303	7	4				
Sphagnales										
Sphagnaceae				4232	6	3				
Bryales										
Hypanaceae				4515	1	1				
Pteridophyta										
Equisetales										
Equisetaceae				4440	1	1				
Spermatophyta										
Angiospermae	4062	106	33	4716	11	32				
Monocotyledoneae	4099	101	30	4770	32	24				
Pandales										
Typhaceae	4340	1	1							5b
Najadales										
Zorasteraceae	3264	7	2	4456	4	3				6a, 5a

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Alismales										
Alismaceae				4987	1	1				--
Hydrocharitales										
Hydrocharitaceae	3178	14	6	4499	4	3				5a
Graminales	4430		20	4552		11				
Gramineae	4320	67	16	4563	3	3				5c, 5d, 8d, 8b, 5a, 6a, 5f, 8a, 5p
Cyperaceae	4870	8	4	4548	12	8				5m, 51, 5a, 5p, 8b, 5k
Liliales										
Juncaceae	4446	4	1	4525	5	3				5k, 51, 5d
Arales				4747		2				
Araceae				4518	1	1				--
Lemnaceae				4975	1	1				--
Xyridales										
Pontederiaceae				4225	1	1				--
Dicotyledoneae				4555	11	8				
Polygonales										
Polygonaceae				4937	1	1				
Ranales				4460		4				
Ceratophyllaceae				4384	3	2				5a

Table 2

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Nymphaceae				4536	3	2				5a
Myrtales				4554		3				
Lythraceae				4650	2	1				5a
Haloragidaceae	3695	5	3	4506	2	2				5a, 5f, 6a
Microconsumers										
Aquatic	4713	8	2	4958	8	2				1
E. coli	5028	3	1	5520	3	1				1
E. intermedia	4398	5	1	4395	5	1				1
Detritus	4414	141	44	4885	264	52				
Aquatic	4421	111	38	5168	111	38				
Roots	2531	2	1	4494	2	1				5g
Leaves	4856	85	31	5335	85	31	6243	81	27	
Aceraceae	4773	1	3	5290	1	3				6a
Fagaceae	4863	33	11	5360	33	11	4405	33	11	6a
Ulmaceae	4905	48	16	5360	48	16	4479	48	16	6a
(Undet.)	4250	3	1	4784	3	1				6a
Bark	3807	4	1	4194	4	1				5o
Particulate organic matter from lake sediments	2229	20	5	4461	20	5				

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Terrestrial	4371	30	6	4117	153	14				5b, 22d, 22e, 22g, 22c
Aquatic	4301	631	155	5465	524	139	672	127	47	
Protozoa				5938	1	1				1
Porifera	1295	6	1	6475	4	1				1, 9a
Platyhelminthes				6332	3	2	1330	1	1	9a
Coelenterata	2886	2	1	5882	2	2	494	1	1	9b
Mollusca	3120	54	16	5492	163	20	480	17	6	
Gastropoda	2024	36	9	5675	100	17	430	5	2	
Prosobranchia										
Mesogastropoda										
Naticidae	4392	2	1							9b
Neogastropoda										
Thaisidae	4595	2	1	5845	4	1	442	2	1	9b
Opisthobranchia										
Tectibranchia										
Scaphandridae	3336	3	1				418	3	1	9b
Nudibranchia				5733	92	13				
Polyceridae				5516	42	5				9a
Onchidondidae				5439	4	1				9a

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Dorididae				5158	4	1				9a
Dironidae				6675	4	1				9a
Aeolidiidae				6446	9	1				9a
Bullidae				6352	5	1				9b
Atyidae				5335	6	1				9b
Aglajidae	923	4	1	5774	18	2				16a, 9a
Pulmonata				5369	4	3				
Stylommatophora										
Succincidae				5415	1	1				9b
Polygyridae				5971	1	1				9b
Philomycidae	910	1	1	4721	2	1				10a
Basommatophora	1014	24	4							
Viviparidae	1571	6	1							9a
Amnicolidae	1560	6	1							9a
Planorbidae	463	12	2							9a
Pelecypoda	4530	18	7				505	12	4	
Protobranchia										
Nuculanidae	4671	9	3				548	9	3	9b
Eulamellibranchia	4424	9	4	4452	63	3				

Table 2

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Mytilidae	4600	3	1							9b
Solenidae				3500	1	1				10a
Semelidae				5097	60	1				9b
Cardiidae	4453	3	1				374	3	1	9b
Sphaeridae	4321	3	2	4759	2	1				9b
Annelida	3910	77	22				645	32	13	
Polychaeta	3503	29	11				639	29	11	
Aphroditidae	3438	3	1				486	3	1	9a
Nereidae	4857	3	1				1059	3	1	9a
Nephthydidae	4061	3	1				747	3	1	9a
Terebellidae	4141	3	1				805	3	1	9a
Maldanidae	3462	6	3				609	6	3	9a
Sternaspidae	2127	3	1				538	3	1	9a
Amphictenidae	3431	5	2				554	5	2	9a
Flabelligeridae	2660	3	1	4700	1	1	463	3	1	9a, 10a
Sipunculida	3389	2	1				595	2	1	9a
Oligochaeta	5575	45	9							
Plesiopora										
Naididae	5530	6	1							9a

Table 2

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Tubificidae	5652	33	7				760	1	1	9a, 13w, 13x, 13y, 9a
Megascolecidiae	5081	6	1							9a
Hirudinea										
Erpobdellidae	5443	1	1							10a
Echinodermata	2020	20	8				351	25	8	
Asteroidea	2131	7	3				579	12	3	
Phanerozonia										
Porcellanasteridae	1828	1	1				608	6	1	
Forcipulata										
Asteriidae	2283	6	2				565	6	2	9a
Holothuroidea	2220	10	4				195	10	4	
Dendrochirota										
Cucumaiidae	3073	3	1				224	3	1	9a
Molpadonia										
Molpadiidae	1619	5	2				145	5	2	9a
Apoda										
Synaptidae	2569	2	1				264	2	1	9a
Echinoidea										
Diadematoidea										

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Strongylocentrotidae	883	3	1				287	3	1	9a
Arthropoda	4726	441	94	5445	339	107	792	49	16	
Crustacea	4510	272	68	5369	299	89	817	26	9	
Branchiopoda	5301	93	28	5517	129	52	393	3	3	
Anostraca				5834	2	2				9a
Conchostraca										9a
Cladocera	5241	71	22	5310	94	31				
Leptodoridae	5461	33	9	5275	50	15				9a, 10c, 10k, 101, 10m, 9i, 10f, 10g, 16f, 16g
Daphnidae	5028	27	10	5292	33	13	314	2	2	9a, 10c, 10o, 10p, 10g, 10h, 10e, 10d, 16f, 10b, 12g
Bosminidae	5232	6	2	5534	6	2				10e, 10d
Chydoridae	5407	5	1	5609	5	1				10h
Ostracoda										
Cypridae	5683	6	1							9a
Copepoda										
Diaptomidae	5741	6	2	5883	18	13	550	1	1	9a, 10c, 11a, 10e, 10d
Eggs (D. articus)				5672		1				16b
Diaptomidae + eggs				5868	19	14				
Cyclopoida										

Table 2

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Cyclopidae	5788	6	2	5778	7	3				11a, 10e, 10d
Cirripedia	5423	4	1	5559	8	2				9a, 14a
Malacostraca	3931	179	40	5161	170	37	1029	20	6	
Amphipoda	4002	23	7	4878	31	9	934	4	2	
Talitridae	4034	9	3	4636	14	6				9a, 10a, 9f
Gammaridae	4050	11	3	5362	17	3	810	1	1	9a, 10d, 10a, 9f
Amphipods (Undet.)	3761	3	1				1058	3	1	
Isopoda				4439	9	2				
Asellidae				4325	2	1				9a
Sphaeromidae	3004	7	1	4553	7	1				11b
Decapoda	3944	149	32	5314	130	26	1077	16	4	
Ocypodidae	2405	8	4							9c, 9d, 9e, 9a
Xanthidae	2091	8	4							9a, 9e, 9c
Pandalidae	4643	13	3	5779	10	2	1320	13	3	9a, 10c, 11a
Maiidae	4410	100	16	5201	91	14	348	3	1	9a, 10c, 11a, 9f, 13d, 13e, 13f, 13l, 13j, 13u, 14a
Hippolytidae	4162	5	1	4735	5	1				10c
Astacidae	4890	15	4	5529	17	6				9a, 10a, 10u, 10s, 11d, 16a
Parastacidae				5732	6	2				10a, 16h
Immature Crayfish				4427	1	1				13a

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Insecta	4823	295	39	5604	156	28	759	23	7	
Ephemeroptera	5469	35	6	6553	7	5				
Heptageniidae	5586	29	5	6216	4	2				13a, 9a, 10i
Baetidae				6409	1	1	1124	2	2	9a
Ephemeridae	4885	6	1							9a
Caenidae				7058	2	2				13a
Odonata	5117	120	11	5898	19	2				
Zygoptera	5350	108	9							
Lestidae	4956	6	1							9a
Agrionidae	5400	102	8	5936	13	1				13a, 13c, 13x, 10v, 11a, 10b
Anisoptera	4066	12	2							13a
Libellulidae	5098	6	1	5860	6	1				13a
Gomphidae	3034	6	1							9a
Coleoptera										
Hydrophilidae	5371	7	1	5908	7	1				
Trichoptera	4999	17	4	5789	13	5				
Limnophilidae	4612	9	2	5643	11	4				13a
Hydropsychidae	5386	8	2	6375	2	1				13a, 9a

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Megaloptera										
Corydalidae	5210	2	1	5375	2	1				13a
Diptera	4276	114	16	5152	108	14	613	21	5	
Chironomidae	5424	19	8	5355	16	6	656	20	4	13a, 9a, 13c, 13g, 12a
Simuliidae				5521	1	1				13a
Culicidae	4936	4	1				439	1	1	--
Stratiomyidae	2869	91	7	4925	91	7				9a, 13e, 13f, 13g, 10a, 12f, 16a, 24a
Brachypoda				4397	1	1				
Chordata										
Vertebrata										
Chondrichthyes (eggs)				5600	1	1				16a
Osteichthyes	5086	31	13	5296	10	4	1493	2	2	
Poeciliidae				5823	1	1				--
Cottidae	4620	4	2	5102	3	1				9a
Centrarchidae	4677	8	4	5130	6	2				9a, 16a, 16e
Gobiidae	3880	6	1							9a
Cyprinidae	5761	11	4							9a, 10t, 10d
Labridae	4880	1	1				1058	1	1	9a
Clupeidae	6360	1	1				1927	1	1	9a
Salmonidae (eggs)	3598	71	11	3736	71	11	1492	71	11	18h

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Terrestrial										
Eumycetes										
Gasteromycetales										
Lycroperdaceae	3856	2	2							2b
Bryophyta				4458	12	6				
Bryales										3a; 3d
Polytrichaceae				4628	4	2				3d, 3a
Dicranaceae				4458	2	1				3a
Aulacomniaceae				4323	2	1				3a
Hynaceae				4355	4	2				3a
Lichenes				4324	18	9				3b
Ascolichenes										
Sterescaulaceae				4616	2	1				3b
Cladoniaceae				4287	16	8				3b
Pteridophyta										
Lycopodiales										
Lycopodiaceae				4609	8	4				3a
Spermatophyta	4539	566	204	4824	352	96				
Gymnospermae										

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Pinaceae	6005	29	8	5729	11	4				4f, 4b, 4h, 4i
Angiospermae	4479	537	196	4785	153	92				
Monocotyledoneae	4365	267	61	4580	16	8				
Gramineae	4357	258	57	4551	12	6				5l, 5c, 8c, 8b, 5a, 5h, 5k, 5b, 6a 5m, 5g
Juncaceae	4790	6	2	4665	4	2				5k, 5l, 5a
Liliaceae	4165	3	2							8b, 5a
Dicotyledoneae	4558	248	125	4879	137	70				
Salicaceae				4904	12	6				5m, 5l, 5c
Corylaceae				5191	4	2				5c
Fagaceae				4930	2	1				6a
Cannabinaceae				5891	1	1				8b
Polygonaceae	4214	19	10	4465	4	2				5a, 8b, 5b, 5l
Chenopodiaceae	4557	17	4							8b, 5b, 5d
Amaranthaceae	4583	4	2							5b, 8b
Phytolaccaceae	5230	2	1							8b
Aizoaceae	5243	2	1							5b
Portulacaceae	4422	2	1							5b
Caryophyllaceae	4357	1	1	4586	6	3				5m, 5l, 8b
Magnoliaceae	4540	1	1	4950	1	1				6a

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Cruciferae	4647	13	6							5b, 8b, 5a
Rosaceae	5346	3	2	4531	8	4				5m, 51, 5k, 8c, 8b
Leguminosae	4678	19	11							5b, 6a, 8b
Linaceae	6154	7	3							8b
Empetraceae	5483	4	2							51
Aceraceae	4829	1	1							8c
Malvaceae	5007	6	3							8b, 8c
Loasaceae	3581	1	1							5a
Umbelliferae	4797	17	6							5b, 5c, 8c
Cornaceae	4495	38	19	4815	38	19				5f, 5o, 5j, 5i, 5g, 5a, 7a, 7d, 7e, 8a, 8e, 7e, 6b, 6d, 6c
Encaceae				5070	40	20				5k, 51, 5m
Primulaceae				4934	4	2				51
Oleaceae	5625	1	1							8b
Apocynaceae	4625	1	1	5640	1	1				6a
Convolvulaceae	4945	2	1							8b
Polemoniaceae	3985	3	3							5a
Hydrophyllaceae	3446	1	1							5a
Verbenaceae	5490	2	1							8b
Labiatae	5339	3	2							8b

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Solonaceae	3858	2	2							5a
Scrophulariaceae	3979	3	1							5b
Plantaginaceae	4017	8	6							8b, 5b, 5a
Rubiaceae	4504	2	1	4678	4	2				5b, 5k, 5l
Campanulaceae	3746	2	1	4822	4	2				5a, 5m, 5l
Compositae	4586	61	29	4444	8	4				5b, 8b, 6a, 5f, 5g, 7a, 5a, 5c, 5m, 5l, 5k, 8c, 5d
Alpine Vegetation (Gr. $\overline{X}$)				4383	173	12				
Alpine forbs				4196	90	6				5b, 5g
Mixed alpine vegetation				4264	3	3				5a
Alpine evergreen shrubs				5098	22	1				5n
Alpine deciduous shrubs				4932	18	1				5n
Alpine herbs				4601	40	1				5n
Mixed Woodland (flora) ground flora				4719	10	2				5b
Old field vegetation	4189	22	10							
O.F. grass & herbs	3994	3	1							5b
O.F. mixed herbs	3892	3	2							5b
O.F. mixed forbes	4315	1	1							5b
O.F. mixed roots	3848	7	2							5g

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
O.F. mixed herbs (shoots)	4581	4	2							5b
O.F. herbs (roots)	4464	4	2							5b
Platyhelminthes										
Turbellaria				5684	1	1				9a
Annelida										
Oligochaeta										
Opisthopora										
Lumbricidae	4569	3	2	5628	1	1	782	1	1	9a
Arthropoda	5289	221	91	5673	155	83	2315	1	4	
Crustacea										
Isopoda	3786	32	6							
Armadillidiidae	2965	4	2							10a
Oniscidae	4197	28	4							10a
Myriopoda				5399	2	2				
Chilopoda										
Cryptopidae				5344	1	1				10a
Diplopoda										
Xystodesmidae				5453	1	1				10a
Arachnomorpha										

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Arachnida	4825	2	8	5531	6	11				
Acaridae				5808	1	1				9a
Lycosidae	4886	1	4	5265	1	4				10a
Tetragnathidae	5164	1	4	5613	1	4				10a
Phalangiidae				5732	1	1				9a
Gnaphosidae				5794	2	1				9a
Insecta	5454	187	77	5703	147	70	2315	1	4	
Collembola										
Entomobryidae				6063	1	1				10a
Hemiptera										
Cercopidae	5638	37	21	5767	85	36				16a, 13d, 13a, 13f, 13g, 13h, 11a, 10c, 12f, 13e
Dictyoptera										
Blattellidae	5397	22	14	5701	16	12				13d, 13e, 13f, 13g, 13h, 13k, 11a, 10n, 10r, 10c, 16i, 16j, 9a, 10a
Orthoptera	5300	31	15	5382		13				
Acrididae	5077	17	6	5339	37	12				10a, 9a, 13a, 15a, 15b, 15c, 15d, 15e, 15f, 15g, 15h, 11a, 10c
Gryllidae				5896	1	1				10a
Tettigoniidae	5449	16	9							13a, 11a, 10c, 10a

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Hymenoptera	4629	30	4							
Formicidae	4549	28	3	6247	1	1				17b, 17c, 17d, 10a
Apidae	4868	2	1							17b
Coleoptera	5556	67	20	6128	4	4				
Tenebrionidae	5852	5	5	6651	2	2	2315	10	4	13a, 12a, 10a
Coccinellidae	5926	18	1							10a
Elateridae	5440	37	13							16a, 13m, 13n, 13o, 13p, 13q, 13r, 13s, 13t, 22a, 12f, 11a, 10c
Carabidae				5672	1	1				10a
Chrysomelidae	5227	1	1	5537	1	1				10a
Diptera	5783	5	2							
Drosophilidae	5797	1	1							13a
Sarcophagiidae				5464	3	3				12d, 12e, 10v
Calliphoridae	5768	4	1							13a
Mixed Insects	5280	1	1							--
Chordata	5606	206	109	6542	86	82	1853	103	20	
Amphibia	1638	6	1	5933	1	3				16d, 13w, 31a, 16a
Reptilia				6567	3	3				
Squamata										
Tguanidae				6550	2	2				16a

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Chelonia										
Emydidae				6600	1	1				16a
Crocodilia										
Crocodylidae	5040	8	1				1050	8	1	3b
Aves	5782	165	91	6595	73	73	1757	92	18	
Chandriiformes										
Laridae	4360	12	4				1935	12	4	20a, 20d, 20e, 20g
Columbiformes										
Columbidae	4919	60	7				1763	60	7	20a, 20b, 20c, 20f, 20h, 10a
Galliformes	4723	20	7				1648	20	7	
Phasianidae	4703	16	6				1693	16	6	20a, 20i, 20j, 20l, 20m, 20k
Numididae	4840	4	1				1380	4	1	10a
Cucuiformes										
Cuculidae	6395	2	2	6875	2	2				10a, 18e
Passeriformes	6034	71	71	6587	71	71				
Parulidae	6230	31	31	6711	31	31				10a, 18e, 18f
Icteridae	7227	3	3	7663	3	3				10a, 18e, 18f
Turidae	6308	13	13	6816	13	13				10a, 18e, 18f
Mimidae	6498	6	6	7003	6	6				10a, 18e, 18f

Ecological and Systematic Position	Cal/gm dry wt.	Total samples	Number averaged	Cal/gm ash-free dry wt.	Total samples	Number averaged	Cal/gm wet wt.	Total samples	Number averaged	Notations: (life stage, sex and parts of organisms used)
Troglodytidae	5205	2	2	5900	2	2				10a, 18e
Fringillidae	5239	12	12	5988	12	12				10a, 18e
Vireonidae	4780	2	2	5400	2	2				10a, 18e
Corvidae	4880	2	2	5765	2	2				10a, 18e
12 species - bird egg yolk				8000	1	1				16a
Mammalia										
Chiroptera							4380	3	1	22b
Rodentia	4891	27	16							11a, 9g, 16k, 10c
Cricetidae	4629	23	12							11a, 9g, 16k, 10c
Muridae	5675	4	4	5835	9	3				--

Table 3. Caloric values for organisms, arranged by trophic level, habitat and taxonomic category. The numbers and/or letter (other than the caloric values and H_2O and ash per cents) notations are defined in the section following the table. The references for the caloric values also follow the table (the "Literature cited" section refers only to non-tabular references). (See text for further explanation.)

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
I. Primary Producers												
A. Aquatic												
Chlorophyta (grass-green algae)												
Volvocales												
Chlamydomonadaceae												
	<u>Chlamydomonas reinhardi</u>	5289.0 ±95.6[4]					12	17	1	3c	6	
Volvocaceae	<u>Pandorina morum</u>		4969					17	1	3c	1	2
Ulotrichales												
Ulotrichaceae												
	<u>Stichococcus bacillaris</u>	5296					6				6	7
Ulvales												
Ulvaceae												
	<u>Monostroma fuscum</u>	4560	5180±20[4] (±500)[5]	2190	12	51.9	2	18	1	3c	46	97a
	<u>Enteromorpha</u> sp.	3010	4700±80[4] (±1700)[5]		36		2	18	1	3c	46	97b

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Ulva fenestrata	4400	4940 ± 50^4 (± 900)[5]		11			1θ	1	3c	46	97a
	U. lactuca	3750	4750 ± 270^4 (± 5600)[5]		21		8	1θ	1	3c	46	97a
	U. rigida	3860	4800 ± 140^4 (± 2900)[5]	1120	19.5	71	8	1θ	1	3c	46	97b
	U. sp.	4000	4940 ± 50^4 (± 1100)[5]		19		5	1θ	1	3c	46	97d
Oedogoniales												
Oedogoniaceae	Oedogonium sp. + diatoms	1134±	4036		72.3		8	5d	1	3c	84	
Cladophorales												
Cladophoraceae												
	Cladophora sp.	2120	5170 ± 580^4 (± 1110)[5]		59		5	1θ	1			97b
	Spongomorpha sp.	3080	4740 ± 190^4 (± 4100)[5]	330	35	89.3	5	1θ	1	3c	46	97b
Chlorococcales												
Oocystaceae												
	Chlorella pyrenoidosa	5444					7		1		6	7
	C. vulgaris	5181					1				6	7
	C. sp.	4735.0	5286.7		10.4		1	17	1	3d	5	87

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Scenedesmaceae												
	Scenedesmus obliquus	5158					1		1		6	7
	" "	5507					1		1		6	7
	S. brasiliensis	5453					1		1		6	7
Zygnemataceae												
	Spirogyra maxima	2449				75.3	6	18	1	7	50	102
	S. spp.	4204.3					1	15	1	3d	5	
	Mixed epiphytic stream (algae)	1150							1	3c	31	82
Siphonales												
Codiaceae												
	Codium fragile	2620	4520±180[4] (±4000)[5]	180	42	93	6	18	1	3c	46	97b
Charales												
Characeae												
	Chara sp. (stonewort)	2255	4798	415	5.0	81.6	1	14	1	3a	55	
	" "		4451(±326)[6]		55	80			1	7	76	127
	Nitella sp.		4413		30	96			1	7	76	127

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Chrysophyta												
Bacillariophyceae (diatoms)												
	Navicula minima	3218±201[4]					6	17	1	3c	8	
	N. sp.	4943					1	17			9	
	Melosira sp.		5150				2	14	1	3a	30	81
	Nitzschia paradora	3280	5470±160[4] (±3000)[5]		40		2	18	1	3c	46	97a
Phaeophyta (Brown algae)												
Ectocarpales												
Ectocarpacae												
	Ectocarpus dimorphus	3820	5090±70[4] (±1400)[5]		25		2	18	1	3c	46	97a
Ralfsiaceae												
	Ralfsia sp.	3120	4160±230[4] (±5600)[5]		25		5	18	1	3c	46	97b

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Chordariales												
Elachistaceae												
	Elachistea fucicola	3920	$5160 \pm 110^{4}_{5}$ (± 2100)		24		2	18	1	3c	46	97a
Desmarestiales												
Desmarestiaceae												
	Desmarestia herbacea	2920	$4170 \pm 80^{4}_{5}$ (± 1900)	290	30	90	3	18	1	3c	46	97b
	D. intermedia	3490	$4720 \pm 220^{4}_{5}$ (± 4800)		26		6	18	1	3c	46	97a
Dictyosiphonales												
Punctariaceae												
	Punctaria expansa	3170	$5110 \pm 220^{4}_{5}$ (± 4300)		38		2	18	1	3c	46	97a
	Scytosiphon lomentaria	2800	$4670 \pm 150^{4}_{5}$ (± 3300)		40		3	18	1	3c	46	97b
Asperococcaceae												
	Colpomenia sinuosa	1290	$3580 \pm 180^{4}_{5}$ (± 4900)	80	64	93.6	2	18	1	3c	46	97c

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Laminariales												
Laminariaceae												
	Laminaria complanata	2650	4340±60[4] (±1500)[5]		39		2	18	1	3c	46	97a
	L. saccharina	2840	4370±80[4] (±1700)[5]	650	35	77	6	18	1	3c	46	97a
	L. setchellii	3280	4430±10[4] (±300)[5]		26		2	18	1	3c	46	97b
Lessoniaceae												
	Pleurophycus gardneri	2760	4310±60[4] (±1300)[5]		36		3	18	1	3c	46	97b
	Costaria costata	2940	4460±160[4] (±3700)[5]	310		89.3	4	18	1	3c	46	97b
	Agarum cribrosum	2860	4330±70[4] (±1500)[5]	590	34	97.3	2	18	1	3c	46	97a
	A. fimbriatum	2980	4580±190[4] (±4100)[6]	460	35	84.7	2	18	1	3c	46	97a
	Hedophyllum sessile	2850	4390±180[4] (±4100)[5]	480	35	83	13	18	1	3c	46	97b

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Nereocystis luetkeana	2100	$4380 \pm 170^{4}_{5}$ (± 3800)	200	52	90.4	5	18	1	3c	46	97b
	Postelsia palmaeformis	3570	$4410 \pm 100^{4}_{5}$ (± 2200)	340	19	90.5	3	18	1	3c	46	97c
	Macrocystis integrifolia	2850	$4320 \pm 60^{4}_{5}$ (± 1400)	520	34	81.8	5	18	1	3c	46	97b
	Pterygophora californica	3970	$4780 \pm 150^{4}_{5}$ (± 3100)	540	17	86.3	3	18	1	3c	46	97b
Alariaceae												
	Alaria marginata	3310	$4660 \pm 140^{4}_{5}$ (± 3000)		29		5	18	1	3c	46	97d
	A. nana	3250	$4330 \pm 190^{4}_{5}$ (± 2400)	620	25	81	6	18	1	3c	46	97b
	Egregia menziesii	3070	$4450 \pm 120^{4}_{5}$ (± 2700)	520	31	83	7	18	1	3c	46	97b
Fucales												
Fucaceae												
	Fucus distichus	3430	$4640 \pm 100^{4}_{5}$ (± 2200)	650	26	81	18	18	1	3c	46	97b

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Pelvetiopsis limitata	3150	$4570 \pm 160^{4}_{5}$ (± 3600)	630	31	80.1	2	18	1	3c	46	97b
Rhodophyta (Red algae)												
Bangiales												
Bangiaceae												
	Bangia fuscopurpurea	4520	$4970 \pm 160^{4}_{5}$ (± 3300)		9		2	18	1	3c	46	97a
	Porphyra nereocystis	4090	$4870 \pm 170^{4}_{5}$ (± 3600)	550	16	86.5	4	18	1	3c	46	97b
	P. perforata	4310	$4790 \pm 50^{4}_{5}$ (± 1000)	630	10	85.4	2	18	1	3c	46	97b
Gelidiales												
Gelidiaceae												
	Gelidium cartilagineum	4400	$5000 \pm 140^{4}_{5}$ (± 2800)	1410	12	68	2	18	1	3c	46	97b
Cryptonemiales												
Corallinaceae												
	Corallina vancouveriensis	1030	$4120 \pm 180^{4}_{5}$ (± 4200)		75		3	18	1	3c	46	97b

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Dilsea californica	3530	4840	530	27	84.9	1	18	1	3c	46	97b
	Constantinea simplex	3040	4530		33		1	18	1	3c	46	97b
	Lithothamnium sp.	670	3940		83		1	18	1	3c	46	97b
	Bossiella sp.	860	3910 ± 170^{4} (± 4300)[5]		78		4	18	1	3c	46	97b
	Serraticardia sp.	690	3290 ± 10^{4} (± 300)[5]		79		2	18	1	3c	46	97b
	Calliarthron sp.	650	3420	490	81	24	1	18	1	3c	46	97b
	Endocladia muricata	4100	4560 ± 60^{4} (± 1200)[5]	1480	10	64	4	18	1	3c	46	97b
	Grateloupia doryphora	3850	4750 ± 70^{4} (± 1400)[5]		19		2	18	1	3c	46	97b
	Prionitis lyallii	3870	4780 ± 100^{4} (± 2200)[5]		19	80	19	18	1	3c	46	97b
	Callophyllis flabellulata	2870	4630 ± 20^{4} (± 500)[5]	410	38	85.7	2	18	1	3c	46	97a
	Erythrophyllum delesserioides	3200	4640		31		1	18	1	3c	46	97b

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Schizymenia pacifica	2950	4470±80[4] (±1900)[5]		34		2	18	1	3c	46	97a
	Opuntiella californica	3340	4640±40[4] (±900)[5]	590	28	82.3	2	18	1	3c	46	97a
Gigartinales												
Gigartinaceae												
	Gigartina corymbifera	3050	4360±80[4] (±1900)[5]	610	30	80	6	18	1	3c	46	97b
	G. papillata	3380	4330±150[4] (±3400)[5]	1280	22	62	11	18	1	3c	46	97b
	Iridaea sp.	2920	3890±190[4] (±5000)[5]	580	25	80.3	9	18	1	3c	46	97b
	Halosaccion glandiforme	4120	4680±90[4] (±2000)[5]	490	12	88.2	4	18	1	3c	46	97b
Rhodymeniales												
Rhodymeniaceae												
	Rhodymenia palmata	2980	4810	590	38	80.3	1	18	1	3c	46	97a

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Ceramiales												
Delesseriaceae												
	Delesseria decipiens	3700	5440 ± 160^{4} $(\pm 2900)^{5}$		32		2	18	1	3c	46	97d
	D. decipiens	3530	4900 ± 160^{4} $(\pm 3200)^{5}$	470	28	86.6	5	18	1	3c	46	97b
Rhodomelaceae												
	Polysiphonia brodiae	3500	5000 ± 140^{4} $(\pm 2800)^{5}$		30		2	18	1	3c	46	97d
	P. sp.	3320	4880 ± 30^{4} $(\pm 700)^{5}$	520	32	84.2	3		1	3c	46	97b
	Pterosiphonia bipinnata	3660	5300 ± 90^{4} $(\pm 1700)^{5}$		31		2		1	3c	46	97d
	P. sp.	3310	4800 ± 140^{4} $(\pm 2900)^{5}$	450	31	86.3	2		1	3c	46	97b
	Laurencia spectabilis	2890	4660 ± 10^{4} $(\pm 300)^{5}$	280	38	90.2	2		1	3c	46	97b
	Rhodomela larix	3410	4940		31		1		1	3c	46	97b
	Antithamnion subulatum	3680	5040 ± 130^{4} $(\pm 2600)^{5}$		27		2	18	1	3c	46	97a
	Microcladia coulteri	3920	4720	740	17	81.2	1	18	1	3c	46	97b

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Ptilota filicina	3390	4780±130[4] (±2600)[5]	600	29	82.3	2	18	1	3c	46	97b
	Membranoptera sp.	3700	4740		22		1	18	1	3c	46	97d
	Polyneura latissima	3650	4620		21		1	18	1	3c	46	97d
	P. latissima	3040	3850±40[4] (±1000)[5]		21		2	18	1	3c	46	97b
	Cryptopleura violacea	3260	4080±20[4] (500)[5]		20		2	18	1	3c	46	97b
	Odonthallia floccosa	3250	4710±110[4] (±2500)[5]	620	31	81	4	18	1	3c	46	97b
Cyanophyta												
Myxophyceae (blue-green algae)												
	Microcystis sp.		4781±812[4] (16.99)[5]					8	1	3c	1	1
	Anabaena solitaria		5410				2	14	1	3a	30	81
	Oscillatonia terebriformis	1249±96[2]	4405		71.9		7	17	1	3c	84	
	Schizothrix calciola	1264±61[2]	4563		72.4		31	5d	1	3c	84	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Schizothrix calcicola + Phormidium sp.	1588±132[2]	4963		68.0		8	17	1	3c	84	
	Mixed blue-green algae		5175±350[6]				4	14	1	3a	81	
	Mixed algal species	4477±63[4]	4469±68[4]		4.1		5	8c	1	5	57	110
	Periphyton		4520				2	17	1	3a	74	
Bryophyta (Mosses)												
Musci												
Sphagnales												
Sphagnaceae												
	Sphagnum spp.		4160				2	14		3a	30	81
	S. fuscum		4326±82[4]				2-3	14	3a	3a	10	8
	S. girensohnii		4211±43[4]				2-3	14	3a	3a	10	8
Bryales												
Hypanaceae												
	Drepanocladus pseudoflorae		4515		12	80				7	76	127

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Pteridophyta (ferns & allies)												
Equisetales												
Equisetaceae												
	Equisetum spp.		4440		12	80				7	76	127
Spermatophyta (seed plants, flowering plants, phanerogams)												
Angiospermae (angiosperms)												
Monocotyledoneae (monocotyledons)												
Pandanales												
Typhaceae												
	Typha spp.	4340(±316)[6]						1B	5b	3a	82	126
Najadales												
Zosteraceae (=Najadaceae = Potamogetonaceae; pond weeds)												
	Potamogeton lucens	3575			16	83			6a		2	3
	P. sp.		4280				2	14	5a	3a	30	81
	P. spp.		4558(±646)[6]		20	85				7	76	127

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Najas flexilis		4529(±282)[6]		20	85				7	76	127
Alismales	" "	2953				92.9	6	18	5a	7	50	102
Alismaceae (water plantain family)												
	Sagittaria sagittifolia		4987		23	90				7	76	127
Hydrocharitales (frogbit's family) Hydrocharitaceae												
	Elodea canadensis (water weed)	3180			23.1	90					2	3
	" "	2428									2	3a
	" "	3385								6	3	
	" "	3105								22		
	" "	3494.5 ±35 [7]					2	14	5a	3a	4	4
	" "	3474.0 ±42.2 [6]					8	14	5a	3d	5	5
	" "		4200				2	14	5a	3a	30	81
	" "		4568(±806)[6]		25	90				7	76	127
	Vallisneria spiralis		4730(±657)[6]		25	90				7	76	127

Ecological and Systematic Position	Species Name	Gram Caloric Values			% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
		Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight								
Graminales												
Gramineae												
	Spartina alterniflora (salt water cord-grass)	4196.1					6	15	5c	3	43	96
	" "	4306.5					8	15	5c	3	43	96a
	S. cynosuroides (salt reed cord grass)	4452.3					5	15	5d	3e	43	
	" "	4862.0					1	15	8d	3e	43	
	S. patens (salt meadow cord grass)	4516.5					10	15	5d	3e	43	96b
	" "	4757.0					10	15	5d	3e	43	96c
	S. maritimus (salt-marsh bulrush)	4385.7					5	15	5d	3e	43	96c
	" "	4189.4					3	15	5d	3e	43	96b
	" "	4895.8					1	15	8b	3e	43	
	S. sp.	4076.7					2	4	5a		14	9
	" "	4096.9					2	8	6a		14	9
	" "	3993.9					3	8	5c		14	9

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	S. sp.	4124.0					3	8	6a		14	9
	" "	3777.0					2	8	5f		14	9
	" "	4109.0±31					3		6a		9	
	" "	4387.0±9					3		8a		9	
	Phragmites communis		4581(±370)[6]		8	50				7	76	127
	Glyceria maxima		4540(±137)[6]		19	80			5a	7	76	127
	" "		4567						5p	7	76	127
Cyperaceae (sedges)												
	Carex bigelowii	4724±72[4]			16.3		2-3	6-7	5m	3a	10	17
	" "	4771±11[4]					2-3	8	5L	3a	10	8
	C. canescens		4582±13[4]				2-3	8	5L	3a	10	8
	C. scirpoides		4617±8[4]				2-3	8	5L	3a	10	8
	C. hudsoni		4268(±385)[6]		5	70			5a	7	76	127
	" "		4283						5p	7	76	127
	C. sp.	4788					2	11a	8b	3c	13	10
	Cyperus erythrorhizos (muhl. sedge)	5196					2	11a	8b	3c	13	10

Ecological and Systematic Position	Species Name	Gram Caloric Values			% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
		Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight								
	<u>Scirpus caespitosus</u> var. <u>callosus</u>		4591 ± 9[4]				2-3	6-7	5k	3a	10	8
	<u>S. caespitosus</u> var. <u>callosus</u>		4695 ± 14[4]				2-3	8	5L	3a	10	8
	<u>S. lacustris</u>		$4556 (\pm 368)$[6]		8	80			5a	7	76	127
	" "		4790						5p	7	76	127
Liliales (=Liliiflorae)												
Juncaceae (rushes)												
	<u>Juncus trifidus</u>		4550 ± 48				2-3	6-7	5k	3a	10	8
	<u>J. trifidus</u>		4571 ± 3				2-3	8	5L	3a	10	8
	<u>J. effusus</u>		$4455 (\pm 18)$[6]		15	80				7	76	127
	<u>J. gerardi</u> (black-grass rush)	4445.5					4	15	5d	3e	43	
Arales (arum family)												
Araceae (arums)												
	<u>Acorus calamus</u>		4518		9					7	76	127
Lemnaceae (duckweeds)												
	<u>Lemna</u> spp.		$4975 (\pm 330)$[6]		25	80				7	76	127

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Xyridales												
Pontederiaceae (pickerel weeds)												
	Heteranthera dubia		4225							7	76	127
Dicotyledoneae (dicotyledons)												
Polygonales												
Polygonaceae (buckwheats)												
	Polygonum amphibium		4937		12	80				7	76	127
Ranales												
Ceratophyllaceae (hornworts)												
	Ceratophyllum demersum (coon-tail)		4260				2	14	5a	3a	30	81
	" "		4508(±450)[6]		25	90				7	76	127
Nymphaceae (water lilies)												
	Nuphar sp.		4480				2	14	5a	3a	30	81
	Nymphaea spp.		4592(±63)[6]		12	85				7	76	127

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Myrtales (=Myrtiflorae)												
Lythraceae (loose strifes)												
	Decadon verticillatus (water oleander)		4650				2	14	5a	3a	30	81
Haloragidaceae (water milfoils)												
	Myriophyllum exalbescens	4162.0 ±.50[7]					2	14	5f	3a	4	6
	" "	3470.5 ±2.7[7]					2	14	6a	3a	4	6
	" "	3451.2	4117.2		11.6		1	14	5a	3d	5	5
	M. spp.		4895(±613)[6]		20	85				7	76	127
B. Terrestrial												
Eumycetes (true fungi)												
Basidiomycetes (club fungi)												
Gasteromycetales												
Lycoperdaceae (puff balls)												
	Astreus hygrometrias	3713						18	2b	3c	23	70

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Astreus hygrometrias	3999						18	2b	3c	23	70
Bryophyta												
Musci(mosses)												
Bryales												
Polytrichaceae												
	Polytrichum juniperinum var. alpestre		4780±7[4]				2-3	14	3d	3a	10	8
	P. piliferum		4475±28[4]				2-3	14	3a	3a	10	8
Dicranaceae												
	Dicranum beigeri		4458±94				2-3	14	3a	3a	10	8
Aulacomniaceae												
	Aulacomnium turgidum		4323±35[4]				2-3	14	3a	3a	10	8
Hynaceae												
	Calliergon stramineum		4300±67[4]				2-3	14	3a	3a	10	8
	mean for 5 species		4410±70[4]				2-3	14	3a	3a	10	8

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Lichenes (lichens)												
Ascolichenes												
Stereocaulaceae												
	Sterocaulon paschale		4616±61[4]				2-3	14	3b	3a	10	8
Cladoniaceae												
	Cladonia gracillis		4520±60[4]				2-3	14	3b	3a	10	8
	C. mitis		4396±12[4]				2-3	14	3b	3a	10	8
	C. mangiferina		4249±15[4]				2-3	14	3b	3a	10	8
	C. alpestris		4203±0[4]				2-3	14	3b	3a	10	8
	Cetraria cucullata		4397±7[4]				2-3	14	3b	3a	10	8
	C. islandica		4132±59[4]				2-3	14	3b	3a	10	8
	C. nivalis		4077±26[4]				2-3	14	3b	3a	10	8
	mean for 8 species		4325±59[4]				2-3	14	3b	3a	10	8

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Pteridophyta (ferns)												
Lycopodiales (club mosses)												
Lycopodiaceae												
	Lycopodium annotinum var. pungens		4952±16[2]				2-3	6-7	3a	3a	10	8
	" "		4992±28[2]				2-3	8	3a	3a	10	8
	Lycopodium salago var. appressum		4629±21[2]				2-3	6-7	3a	3a	10	8
	" "		3862±18[2]				2-3	8	3a	3a	10	8
Spermatophyta (phanerogams)												
Gymnospermae (gymnosperms)												
Coniferales												
Pinaceae												
	Pinus ponderosa	5625.0							4f		11	
	P. contorta murrayana	5939.2							4f		11	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	P. contorta	5119±83[4]					10	7	4b	3	42	95a
	" "	4928±73[4]					9	7	4b	3	42	95b
	P. lambertiana	6480.2							4f		11	
	P. flexilis	7117.2							4f		11	
	P. strobus (white pine)		5290				2	14	4b	3a	30	81
	Pseudotsuga taxifolia	5998.3							4f		11	
	Larix larcina (larch)		5260				2	14	4b	3a	30	81
	Thuja occidentalis (arbor vitae)		5250				2	14	4h	3a	30	81
	Pollen (*Pinus* & *Abies*)	6830±199[4]	7114±210[4]		4		5	14	4i	5	59	
Angiospermae (angiosperms)												
Monocotyledoneae (monocotyledons)												
Glumiflorae												

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Gramineae (grasses)												
	Agropyron trachycaulon var. majus		4629±15[4]				2-3	8	5L	3a	10	8
	Andropogon sp.	4232.0					2	10	5c	3a	12	9
	A. furcatus (big bluestem)	5068					1	11a	8c	3c	13	10
	Avena sativa (cultivated oat)	4238.3							8b		11	
	A. sativa	4690±50[1]					6	13	5a	3c	40	93
	Agrostis borealis (bent grass)		4483±2[4]				2-3	8	5L	3a	10	8
	Bromus inermis (brome grass)	4491					3	11a	8b	3c	13	10
	Calamogrostis canadensis var. scabra (reed bent grass)		4554±33[4]				2-3	8	5L	3a	10	8
	Carex sp.	4330±10[4]					4	13	5h	3c	40	93
	Deschampsia flexuosa (hair grass)		4506±19[4]				2-3	6-7	5k	3a	10	8

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	D. flexuosa		4558±15[4]				2-3	8	5L	3a	10	8
	Digitaria ischaemum (finger grass)	4616					2	11a	8b	3c	13	10
	D. sanguinalis (crab grass)	4380					2	11a	8b	3c	13	10
	D. sanguinalis	4783±1[7]					2	14	5b	3c	39	91
	Cenchurus sp. (sand bur)	3532.3					2	5	5a		14	9
	Cynodon dactylon (Bermuda grass)	4100.7					3	10	5c		12	9
	Eichinochloa crusgalli (barnyard grass)	4695					2	11a	8b	3b	13	10
	E. crusgalli	4819					1	11a	8c	3c	13	10
	Elymus virginicus (wild rye)	4695					2	14	8b	3c	13	10
	Festuca sp. (fesque grass)	4106.4					2	10	5a		14	9
	Leptoloma sp.	3825						18	6a	3c	23	70
	" "	4248						18	6a	3c	23	70

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	<u>Lolium perenne</u>	5008±1[7]					2	14	5b	3c	39	91
	" "	4686±1[7]					2	14	5b	3c	39	92
	<u>Muhlenbergia schreberi</u> (drop seed)	4589					2	11a	8c	3c	13	10
	<u>Panicum capillare</u> (old witch grass)	4700					2	11a	8b	3c	13	10
	<u>P. decotomiflorum</u>	4647					2	11a	8b	3c	13	10
	<u>P. miliaceum</u> (prosa millet)	4290					5	8-9	8b	3	15	11
	<u>Poa compressa</u>	4017.0±45[4]					3	5	5c		12	12
	<u>P. compressa</u>	3998.0±112[4]					3	7	5c		12	12
	" "	4125.3±77[4]					5	7	5c		12	12
	" "	4179.1±200[4]					9	8	5c		12	12
	" "	4306.6±450[4]					14	9	5c		12	12
	" "	4175.1±80[4]					15	11	5c		12	12
	" "	4290±60[4]					8	13	5c	3c	40	93
	<u>P. fernaldiana</u>	4559±27[4]					2-3	6-7	5m	3a	10	8
	" "	4469±10[4]					2-3	8	5L	3a	10	8

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Sataria lutescens (yellow foxtail)	4700					5	8-9	8b		15	11
	S. lutescens	4494					2	11a	8b	3b	13	10
	S. viridis (green foxtail)	4400					5	8-9	8b		15	11
	S. viridis	4534					2	11a	8b	3b	13	10
	S. faberii (giant foxtail)	4585					2	11a	8c	3c	13	10
	Trisetum spicatum var. *pilosiglume*		4577±42[4]				2-3	8	5L	3a	10	8
	Sorghum vulgare (sorghum)	4017.6							8b		11	
	S. halpense	4223.7					2	9	6a		14	9
	Triodia flava (tall red-top)	4430±50[4]					4	15	5h	3c	40	93
	Triticum aestivum (wheat)	4347					2	11a	8b	3b	13	10
	T. aestivum	3960					5	8-9	8b	3	15	11
	" "	4282.3					5				11	
	" "	3585.0							5a		11	13

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	T. aestivum	4042.0							5a		11	14
	Zea mays (corn maize)	4415.2							8b		11	13
	Z. mays	4317					2	11a	8b	3b	13	10
	Z. mays	4060					5	8-9	8b	3	15	11
	Mixed grasses (alpine)	4170.2					15	8	5b	7	16	15a
	Mixed grasses	4189.5					15	8	5b	7	16	15b
	" "	4166.2					15	8	5b	7	16	15c
	" "	4161.3					15	8	5g	7	16	15a
	" "	4208.1					15	8	5g	7	16	15b
	" "	4168.8					15	8	5g	7	16	15c
	Mixed grasses (old field)	4386 ± 79^4						25	5b	3c	47	98
	Alpine sedge meadow	4708.0 ± 10^4					3	6	5a		17	40
	" "	4744.0 ± 23^4					3	7	5a		17	40
	" "	4681.0 ± 4^4					3	8	5a		17	40
Liliales (=Liliiflorae)												
Juncaceae (rushes)												

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Luzula spicata (wood rush)		4427±22				2-3	6-7	5k	3a	10	8
	L. spicata		4902±8				2-3	8	5L	3a	10	8
	Alpine juncusheath	4740.0±5[4]					3	6	5a		17	41
	Alpine juncusheath	4839.0±11[4]					3	7	5a		17	41
Liliaceae												
	Smilax hispida (catbrier)	4554					2	11a	8b	3c	13	10
	Allium cepa (onion)	3777.0							5a		11	14
Dicotyledoneae (dicoltyledons)												
Salicales												
Salicaceae (willows)												
	Salix herbacea		5046±4				2-3	6-7	5m	3a	10	8
	S. herbacea		4892±8				2-3	8	5L	3a	10	8
	S. planiflora		4875±13				2-3	6-7	5c	3a	10	8
	" "		4857±26				2-3	8	5c	3a	10	8
	S. uva-ursi		4975±19				2-3	6-7	5m	3a	10	8

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	S. uva-ursi		4784±43				2-3	8	5m	3a	10	8
Fagales												
Corylaceae (=Betulaceae)												
	Betula minor (dwarf white birch)		5152±15				2-3	6-7	5c	3a	10	8
	B. minor		5230±8				2-3	8	5c	3a	10	8
Fagaceae (beeches)												
	Quercus sp.		4930				2	14	6a	3a	30	81
Utricales												
Cannabinaceae												
	Cannabis sativa (hemp)		5890.7						8b		11	
Polygonales												
Polygonaceae												
	Rumex sp. (dock)	3335.8							5a		14	9
	R. sp.	3509.7							5a		14	9
	R. patientia	3834.0							5a		11	18
	" "	3688.0							5a		11	19

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	R. crispus (yellow dock)	4786					2	11a	8b	3c	13	10
	Polygonum aviculare (typical knotweed)	4830±1[7]					2	14	5b	3c	39	91
	P. viviparum (buckwheat)		4516±6				2-3	6-7	5L		10	8
	" "		4413±1				2-3	8	5L		10	8
	P. convolvulus (black bindweed)	4615					2	11a	8b	3c	13	10
	" "	4210					5	8-9	8b	3	15	20
	P. scandens (false buck-wheat)	4814					2	11a	8b	3c	13	10
	P. pennsylvanicum (knotweed)	4514					2	11a	8b	3b	13	10
Centrospermae												
Chenopodiaceae												
	Chenopodium sp. (mostly C. album, lamb's quarter)	4913					2	11a	8b	3b	13	10
	C. album	4630					5	8-9	8b	3	15	20
	" "	5034±1[7]					2	14	5b	3c	39	91

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Salicornia europaea (glasswort)	3650.3					8	15	5d	3e	43	
Amaranthaceae												
	Amaranthus hybridus (hybrid pigweed)	4542 ± 1[7]					2	14	5b	3c	39	91
	A. retroflexus (pigweed)	4623					2	11a	8b	3b	13	10
Phytolaccaceae												
	Phytolacca americana (pokeweed)	5230					2	11a	8b	3c	13	10
Aizoaceae												
	Mollugo verticillata	5243 ± 2[7]					2	14	5b	3c	39	91
Portulacaceae												
	Portulaca oleracea (common purslane)	4422 ± 1[7]					2	14	5b	3c	39	91
Caryophyllaceae												
	Arenaria groenlandica (mountain daisy)		4764 ± 27[4]				2-3	6-7	5m	3a	10	8

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	A. groenlandica		4144±36[4]				2-3	8	51	3a	10	8
	Mollugo verticillata (carpetweed)	4357					1	11a	8b	3c	13	10
	Silene acaulis var. *exscapa* (moss campion)		4850±37[4]				2-3	6-7	51	3a	10	8
Magnoliales												
Magnoliaceae												
	Liriodendron tulipifera (tulip tree)	4540	4950		10		1	6	6a	3b	44	
Rhoeadales												
Cruciferae												
	Barbarea vulgaris (common winter-cross)	4529±2[7]					2	14	5b	3c	39	92
	Brassica sp. (mustard)	4608					2	11a	8b	3c	13	10
	B. arvensis (field mustard)	5980					5	8-9	8b	3	15	20
	B. nigra	6049.5							8b		11	

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	Capsella sp. (shephard's purse)	4491.5							5a		14	9
	Lepidium campestre (cow-cress)	4224±1[7]					2	14	5b	3c	39	92
Rosales												
Rosaceae												
	Potentilla tridentata (3-toothed cinquefoil)		4673±14[4]				2-3	6-7	5m	3a	10	8
	P. tridentata		4701±37[4]				2-3	8	5L	3a	10	8
	Geum peckii (avens)		4337±22[4]				2-3	6-7	5k	3a	10	8
	G. peckii		4411±11[4]				2-3	8	5L	3a	10	8
	G. canadense	5693					1	11a	8c	3c	13	10
	" "	4998					2	11a	8b	3c	13	10
Leguminosae												
	Lespedeza sp. (bush clover)	4438.8					3	10	5b		12	12
	L. cunesta	4630.0					2	9	6a		14	
	L. striata	4666.4					2	9	6a		14	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	L. stipulacea (Korean bush-clover)	4965					1	11a	8b	3c	13	10
	Trifolium pratense (red clover)	4980					2	11a	8b	3c	13	10
	T. sp.	4092.9±200[4]					2	8	5b		12	12
	Medicago sativa (alfalfa)	5068.9							8b		11	
	Glycine max (soybean)	5328					2	11a	8b	3b	13	10
	Gleditsia triacanthos (honey locust)	4316					2	11a	8b	3c	13	10
	Melilotus alba (sweet clover)	4687					1	11a	8b	3c	13	10
	Phaseolus coccinous	4282.2							8b		11	
Geraniales												
Linaceae												
	Linum usitatissimum (flax)	6300					5	8-9	8b	3	15	20

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Euphorbia maculata (milk purslane)	5326						11a	8b	3c	13	10
	Ricinus communis (castor bean)	6834.7							8b		11	
Sapindales												
Empetraceae												
	Empetrum eamesii spp. hermaphroditum (rockberry)	5559±4[4]					2-3	6-7	5L	3a	10	8
	E. eamesii hermaphroditum	5406±13[4]					2-3	8	5L	3a	10	8
Aceraceae												
	Acer saccharinum (silver maple)	4829					1	18	8c	3c	13	10
Malvales												
Malvaceae												
	Sida spinosa (sida)	5045					2	11a	8c	3c	13	10
	S. spinosa	4946					2	11a	8b	3b	13	10

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Abutilon theophrasti (Indian mallow)	5029					2	11a	8b	3c	13	10
Parietales												
Loasaceae												
	Mentzelia lindleyi	3581.0							5a		11	18
Umbelliflorae												
Umbelliferae												
	Daucus carota (Queen Anne's lace)	3915.0±450					5	8	5b		12	12
	D. carota	4207.5±.51[7]					2			3a	4	
	" "	4090±60[4]					6	13	5c	3c	40	93a
	" "	4530±30[4]					2	16	5c	3c	40	93a
	Pastinaca astiva (parsnip)	6088					1	11a	8c	3c	13	10
	Sanicula canadensis (black snake root)	5953					1	11a	8c	3c	13	10

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Myrtiflorae												
Cornaceae												
	Cornus florida (flowering dogwood)	4630	4740		2.4		2	11	5f	3a	41	94
	" "	4330	4880		11.2		2	11	5o	3a	41	94
	" "	4690	4710		0.5		2	11	5j	3a	41	94
	" "	4670	4950		5.7		2	11	5i	4a	41	94
	" "	4580	4640		1.4		2	11	5g	3a	41	94
	" "	4560	4680		2.6		2	11	5a	3a	41	94a
	" "	4540	5010		9.4		2	3	7a	3a	41	94
	" "	4370	4710		7.2		2	4	7a	3a	41	94
	" "	4490	4780		6.0		2	4	7d	3a	41	94
	" "	4220	4620		8.6		2	4	7e	3a	41	94
	" "	4850	5140		5.4		2	9	8a	3a	41	94
	" "	4920	5170		4.9		2	9	8e	3a	41	94
	" "	4400	4850		9.2		2	9	7e	3a	41	94
	" "	4410	4820		8.5		2	4	6b	3a	41	94
	" "	4230	4610		8.2		2	8	6b	3a	41	94
	" "	4390	4800		8.6		2	8	6d	3a	41	94

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Cornus florida (flowering dogwood)	4290	4680		8.4		2	9	6c	3a	41	94
		4190	4590		8.7		2	9	6c	3a	41	94
	" "	4640	5100		9.0		2	9	6c	3a	41	94b
Ericales												
Ericaceae												
	Loiseleuria procumbens (alpine azalea)		5227 ± 5^4				2-3	6-7	5k	3a	10	8
	L. procumbens		5437 ± 42^4				2-3	8	5L	3a	10	8
	Cassiope hypnoides		5186 ± 7^4				2-3	6-7	5L	3a	10	8
	C. hypnoides		5260 ± 25^4				2-3	8	5L	3a	10	8
	Rhododendron lapponicum (lapland rosebay)		5261 ± 31^4				2-3	6-7	5L	3a	10	8
	R. lapponicum		5331 ± 16^4				2-3	8	5L	3a	10	8
	Ledum groenlandicum (labrador tea)		5148 ± 36^4				2-3	6-7	5k	3a	10	8
	L. groenlandicum		5179 ± 24^4				2-3	8	5L	3a	10	8
	Arctostaphylos alpina (alpine bearberry)		4811 ± 3^4				2-3	6-7	5k	3a	10	8

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	A. alpina		4836±50[4]				2-3	8	5L	3a	10	8
	Phyllodoce caerulea		4960±52[4]				2-3	6-7	5L	3a	10	8
	P. caerulea		4970±32[4]				2-3	8	5L	3a	10	8
	Vaccinium caespitosum (dwarf bilberry)		4913±23[4]				2-3	6-7	5k	3a	10	8
	V. caespitosum		4932±43[4]				2-3	8	5L	3a	10	8
	V. vitis-idaea var. minus (mt. cranberry)		4986±20[4]				2-3	6-7	5m	3a	10	8
	V. vitis-idaea var. minus		5064±17[4]				2-3	8	5L	3a	10	8
	V. angustifolium (low sweet)		5086±10[4]				2-3	6-7	5k	3a	10	8
	" "		4962±21[4]				2-3	8	5L	3a	10	8
	V. uliginosum var. alpinum (alpine bilberry)		4913±23[4]				2-3	6-7	5k	3a	10	8
	" "		4932±43[4]				2-3	6-7	5L	3a	10	8
Primulales												
Primulaceae												
	Diapensia lapponica		4942±36[4]				2-3	6-7	5L	3a	10	8

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	D. lapponica		4925±3[4]				2-3	8	5L	3a	10	8
Oleales												
Oleaceae												
	Fraxinus nigra (black ash)	5625					1	11a	8b	3c	13	10
Gentianales												
Apocynaceae												
	Apocynum cannabinum (indian hemp)	4625	5640		18.0 ±.6		1	7	6a	3b	45	
Tubiflorae												
Convolvulaceae												
	Ipomoea purpurea (morning glory)	4945					2	11a	8b	3c	13	10
Polemoniaceae												
	Gilia capitata (standing cypress)	4204.0							5a		11	18
	G. capitata	4268.0							5a		11	22
	" "	3482.0							5a		11	23

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Hydrophyllaceae												
	Phacelia graniflora (scorpion weed)	3446.0							5a		11	
Verbenaceae												
	Verbena urticaefolia (white vervain)	5490					2	11a	8b	3	13	25
Labiatae												
	Leonurus cardiaca (common motherwart)	5783					1	11a	8b	3c	13	10
	Teucrium canadense (American germander)	4894					2	11a	8b	3c	13	10
Solanaceae												
	Solanum tuberosum	3932.0							5a		11	22
	S. tuberosum	3783.0							5a		11	26
Scrophulariaceae												
	Verbascum thapsus (common mullein)	3978.9±140					3	8	5b		12	12

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Plantaginales												
Plantaginaceae												
	Plantago sp. (plaintain)	5204					2	11a	8b	3c	13	10
	P. sp.	3794.7±89					2	8	5b		12	12
	P. lanceolata (ribgrass)	3628.0							5a		11	27
	" "	3641.0							5a		11	18
	" "	3826.0							5a		11	18
	" "	4008.2							5a		11	28
Rubiales												
Rubiaceae												
	Galium sp. (bed straw)	4504					2	11a	5b	3c	13	10
	Houstonia caerulea var. faxonorum (bluets)		4684±22[4]				2-3	6-7	5k	3a	10	8
	" "		4672±34[4]				2-3	8	5L	3a	10	8
Campanulatae												
Campanulaceae												

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Specularia sp. (Venus's looking glass)	3746.3					2	5	5a		14	
	Campanula rotundifolia var. arctica (harebell)		4696±6[4]				2-3	6-7	5m	3a	10	8
	C. rotundifolia var. arctica		4947±32[4]				2-3	8	5L	3a	10	8
Compositae												
	Anthemis cotula (mayweed)	4011±1[7]					2	14	5b	3c	39	92
	Helianthus annus (sunflower)	6759.2							8b		11	
	H. annus	3993.2							6a		11	29
	" "	3497.6							6a		11	30
	" "	3825.5							6a		11	31
	" "	3850.0							5f		11	32
	" "	3951.0							5g		11	33
	" "	4307.7							7a		11	34
	Haplopappus sp.	4483.6					2	10	5a		14	
	H. sp.	4427.3					3	10	5f		14	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Cirsium arvense (can. thistle)	3933.9±223					6	8	5b		12	12
	C. discolor (common thistle)	4550±10^4					4	15	5c	3c	40	93
	Erigeron annuus (daisy flea-bane)	3989±1^7					2	14	5b	3c	39	92
	Heterotheca sp. (camphorn weed)	4303.5					2	10	5f		14	
	H. sp.	4289.6					2	5	5a		14	
	Kuhnia eupatorioides (false boneset)	4800±10^4					4	17	5c	3c	40	93
	Verbesina encelioides (crown beard)	3809.0							5a		11	24
	Vernonia noveboracensis (ironweed)	4400±70^4					4	15	5c	3c	40	93
	Zinnia grandiflora (garden zinnia)	6834.7							8b		11	24
	Solidago cutleri (goldenrod)		4331±9^4				2-3	6-7	5m	3a	10	8
	S. cutleri		4503±54^4				2-3	8	5L	3a	10	8

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	S. macrophylla var. thyrsoidea		4528±30[4]				2-3	6-7	5k	3a	10	8
	" "		4413±2[4]				2-3	8	5L	3a	10	8
	S. sp.	4700±0[4]					4	15	5c	3c	40	93
	Ambrosia trifida (great ragweed)	5802					2	11a	8c	3c	13	10
	A. artemisiifolia (common ragweed)	5286					2	11a	8b	3c	13	10
	" "	5266±1[7]					2	14	5b	3c	39	91
	" "	3837±1[7]					2	14	5b	3c	39	92
	Aster subulatus (Aster)	4293.4					1	15	5d	3e	43	
	A. spp. (mostly pilosus)	5737					2	11a	8b	3c	13	10
	Arctium sp. (burdock)	4975					2	11a	8b	3c	13	10
	Taraxacum officinale (common dandelion)	5105					1	11a	8b	3c	13	10
	Lactuca sativa (lettuce)	3982±34[2]				95	3		6a	4	64	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Alpine forbs		4198.6				15	8	5b	7	16	15a
	" "		4267.7				15	8	5b	7	16	15b
	" "		4191.7				15	8	5b	7	16	15c
	" "		4165.6				15	8	5g	7	16	15a
	" "		4174.9				15	8	5g	7	16	15b
	" "		4175.7				15	8	5g	7	16	15c
	Mixed alpine vegetation		4286.0					8	5a	7	16	35a
	" "		4241.3					8	5a	7	16	35b
	" "		4264.5					8	5a	7	16	35c
	11 species alpine evergreen shrubs		5098 ± 48^4				22-33	6-8	5n	3a	10	36
	9 sp. alpine deciduous shrubs		4932 ± 33^4				18-27	6-8	5n	3a	10	36
	20 sp. alpine shrubs (ave. of two above)		5024 ± 34^4				40-60	6-8	5n	3a	10	36
	20 sp. alpine herbs		4601 ± 29^4				40-60	6-8	5n	3a	10	36
	Mixed woodland ground flora		4680				2	14	5b	3a	30	81
	" "		4758±260				8	14	5b	3a	30	81

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Old field grass & herbs	3994.1±97[4]					3	4	5b		12	37
	Old field mixed herbs	3972.0±124[4]					3	5	5b		12	38
	" "	3812.0±119[4]					3	7	5b		12	38
	Mixed forbes (old field)	4315±156[4]						4c	5b	3c	47	98
	Old field mixed roots	3302.5±196[4]					6	8	5g		12	39
	" "	4394±122[4]						10	5g	3c	47	98
	Mixed old field herbs (shoots)	4983±1[7]					2	14	5b	3c	39	91
	" "	4179±1[7]					2	14	5b	3c	39	92
	Mixed old field herbs (roots)	4519±1[7]					2	14	5b	3c	39	91
	" "	4409±1[7]					2	14	5b	3c	39	92
II. Microconsumers												
A. Aquatic												
Schizophyta (bacteria)												
	Escherichia coli	5028.2±8.1	5520.2±339.8		8.8		3	17	1	3d	5	84

Ecological and Systematic Position	Species Name	Gram Caloric Values			% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
		Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight								
	E. intermedia	4398±63[4]	4395±62[4]		1.9		5	8c	1	5	57	109
B. Detritus (partially decayed organic matter plus bacterial and fungal flora)												
1. Aquatic												
	Roots (stream detritus)	2531.4±1.6[6]	4494.3±99.2[6]		43.7		2	1	5g	3d	5	43
	Leaves (stream detritus)	4249.6 ±141.4[6]	4783.7 ±250.0[6]		11.1		3	1	6a	3d	5	43
Aceraceae												
	Acer sp.	4773±102[2]	5290		9.7		3	5d	6a	3c	84	
Fagaceae (beeches)												
	Alnus rugosa (alder)	5092±447[4]	5687±564[4]	4528±372[4]	10.39	11.02	3	10	6a	5	79	129i
		4989±174[4]	5460±145[4]	4530±119[4]	8.10	9.88	3	10	6a	5	79	129j
		5196± 80[4]	5680±109[4]	4678± 80[4]	8.59	9.92	3	10	6a	5	79	129k
		5137±120[4]	5676±141[4]	4563± 84[4]	9.49	11.16	3	10	6a	5	79	129l
		4961±210[4]	5401±290[4]	4414±210[4]	8.11	11.01	3	10	6a	5	79	129m
		4806±349[4]	4303±338[4]	4264±309[4]	9.39	11.61	3	10	6a	5	79	129n

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Quercus alba	4791±201[4]	5257±238[4]	4378±117[4]	8.84	8.54	3	10	6a	5	79	129i
	" "	4574± 65[4]	5016± 60[4]	4225± 87[4]	8.83	7.63	3	10	6a	5	79	129j
	" "	4459±313[4]	4909±350[4]	4100±315[4]	9.16	8.05	3	10	6a	5	79	129k
	" "	4626±182[4]	5172±166[4]	4226±134[4]	9.89	7.84	3	10	6a	5	79	129l
	" "	4863± 63[4]	5400± 40[4]	4508± 20[4]	9.93	7.27	3	10	6a	5	79	129m
Ulmaceae (elm)												
	Ulmus americana	4885±197[4]	5507±196[4]	4416±157[4]	11.3	9.4	3	10	6a	5	79	129a
	" "	4731± 25[4]	5319± 56[4]	4306± 19[4]	11.0	8.9	3	10	6a	5	79	129a
	" "	4696± 73[4]	5209± 81[4]	4288± 68[4]	9.9	8.7	3	10	6a	5	79	129a
	" "	4877± 90[4]	5357± 84[4]	4423± 61[4]	8.9	9.3	3	10	6a	5	79	129a
	" "	4841±115[4]	5287±117[4]	4416± 62[4]	8.4	8.8	3	10	6a	5	79	129a
	" "	4959±123[4]	5363±142[4]	4512±109[4]	7.5	9.0	3	10	6a	5	79	129a
	" "	5049±234[4]	5427±228[4]	4602±223[4]	7.0	8.9	3	10	6a	5	79	129a
	" "	5131±236[4]	5523±246[4]	4675±215[4]	7.1	8.9	3	10	6a	5	79	129a
	" "	4691±147[4]	5223±160[4]	4292±129[4]	9.9	8.5	3	10	6a	5	79	129b
	" "	4691± 95[4]	5221±180[4]	4274± 31[4]	10.1	8.9	3	10	6a	5	79	129b
	" "	4885±193[4]	5331±230[4]	4468±187[4]	8.4	8.5	3	10	6a	5	79	129b
	" "	5030±168[4]	5431±186[4]	4602±133[4]	7.4	8.5	3	10	6a	5	79	129b

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	<u>Ulmus</u> <u>americana</u>	4889±160[4]	5277±171[4]	4513±124[4]	7.4	7.7	3	10	6a	5	79	129b
	" "	5187±363[4]	5588±389[4]	4722±344[4]	7.2	9.0	3	10	6a	5	79	129b
	" "	5031±170[4]	5397±176[4]	4624±131[4]	6.8	8.0	3	10	6a	5	79	129b
	" "	4911±186[4]	5301±2144	4537±163[4]	7.3	7.7	3	10	6a	5	79	129b
	" "	5000±257[4]	5604±310[4]	4520±220[4]	10.5	9.6	3	10	6a	5	79	129c
	" "	4864±170[4]	5414±190[4]	4384±153[4]	10.3	9.9	3	10	6a	5	79	129c
	" "	4778±190[4]	5336±178[4]	4363±179[4]	10.5	8.7	3	10	6a	5	79	129c
	" "	4856±273[4]	5362±316[4]	4464±224[4]	9.4	8.0	3	10	6a	5	79	129c
	" "	5066±187[4]	5565±150[4]	4642±157[4]	9.0	8.4	3	10	6a	5	79	129c
	" "	5367± 42[4]	5889± 30[4]	4947± 20[4]	8.9	7.8	3	10	6a	5	79	129c
	" "	5318±107[4]	5693±128[4]	4954± 79[4]	6.6	6.8	3	10	6a	5	79	129c
	" "	5241±150[4]	5629±182[4]	4882±119[4]	6.9	6.8	3	10	6a	5	79	129c
	" "	4824±358[4]	5339±375[4]	4409±328[4]	9.7	8.6	3	10	6a	5	79	129d
	" "	4868±122[4]	5359±149[4]	4479±122[4]	9.2	7.9	3	10	6a	5	79	129d
	" "	4867±135[4]	5300±185[4]	4540±148[4]	8.1	6.7	3	10	6a	5	79	129d
	" "	4890±138[4]	5261±213[4]	4550± 80[4]	6.2	6.4	3	10	6a	5	79	129d
	" "	4939±312[4]	5285±283[4]	4631±342[4]	6.0	6.6	3	10	6a	5	79	129d
	" "	5374± 91[4]	5737± 90[4]	5052± 92[4]	6.3	6.0	3	10	6a	5	79	129d
	" "	5339±104[4]	5660± 92[4]	4986± 93[4]	5.7	6.6	3	10	6a	5	79	129d

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Ulmus americana	5007±276[4]	5350±292[4]	4678±263[4]	6.6	6.6	3	10	6a	5	79	129d
	" "	5001±149[4]	5532±124[4]	4480±123[4]	9.7	10.3	3	10	6a	5	79	129e
	" "	4973±136[4]	5468±157[4]	4478±132[4]	9.0	9.8	3	10	6a	5	79	129e
	" "	5105±277[4]	5616±366[4]	4610±250[4]	9.1	9.6	3	10	6a	5	79	129e
	" "	5360±238[4]	5794±272[4]	4845±240[4]	7.5	9.4	3	10	6a	5	79	129e
	" "	4788± 97[4]	5235± 53[4]	4339± 14[4]	8.9	8.8	3	10	6a	5	79	129f
	" "	4933±209[4]	5328±207[4]	4410±124[4]	7.4	10.9	3	10	6a	5	79	129f
	" "	5131±153[4]	5492±162[4]	4684±127[4]	6.6	8.8	3	10	6a	5	79	129f
	" "	5130±141[4]	5386±134[4]	4650±123[4]	4.7	9.1	3	10	6a	5	79	129f
	" "	4660± 50[4]	5101± 69[4]	4259± 68[4]	9.0	8.6	3	10	6a	5	79	129g
	" "	4873± 13[4]	5294± 25[4]	4437± 21[4]	8.0	8.8	3	10	6a	5	79	129g
	" "	4982±245[4]	5375±267[4]	4603±197[4]	7.3	7.6	3	10	6a	5	79	129g
	" "	5149±142[4]	5527±141[4]	4763± 99[4]	6.8	7.5	3	10	6a	5	79	129g
	" "	4846± 63[4]	5302± 42[4]	4452± 22[4]	8.6	8.1	3	10	6a	5	79	129h
	" "	5188±192[4]	5593±246[4]	4811±174[4]	7.2	7.3	3	10	6a	5	79	129h
	" "	5138± 30[4]	5514± 63[4]	4744± 46[4]	6.9	7.7	3	10	6a	5	79	129h
	" "	5332± 89[4]	5689± 83[4]	4955± 69[4]	6.3	7.1	3	10	6a	5	79	129h
	Bark (stream detritus)	3807.3 ±149.9	4194.0 ±225.8		9.2		4 4	1 1	5o 5o	3d 3d	5 5	43

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Particulate organic matter from lake sediments	448	3158		84.2		4*	18	24c	10	80	131a
	" "	738	3586		77.3		4*	18	24c	10	80	131b
	" "	1518	4254		65.8		4*	18	24c	10	80	131c
	" "	3725	5399		30.8		4*	18	24c	10	80	131d
	" "	4717	5910		20.3		4*	18	24c	10	80	131e
2. Terrestrial												
	Old field ground litter	4397.8					2				14	44
	Dead grass (primarily _Poa compressa_ from old field)	3906.8±54[4]					8	8	5b		12	12
	" "	4246.1±62[4]					15	2	5b		12	12
	Dead grasses and herbs (old field)	4257						4	5b	3c	47	98
	Dead _Quercus_ leaves		5070				2	14	24d	3a	30	81
	Dead _Pinus strobus_ needles		5370				2	14	24d	3a	30	81
	Mixed dead tree leaves (woodland)		4960				2	14	24d	3a	30	81
	Mixed dead woodland ground flora		4660±30[6]				4	14	5b	3a	30	81
	Dead _Thuja occidentalis_ twigs		5275±19[6]				4	14	24e	3a	30	81

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Dead Larix larcina		5210				4	14	24d	3a	30	81
	Dead Cornus florida	4570	5040		9.4		2	15	24g	3a	41	94c
	" "	4850	5380		9.8		2	15	24g	3a	41	94d
	Particulate organic matter from old field soil		3412±270[2]				12	14	24c	3b	48	99a
	" "		2721±357[2]				13	14	24c	3b	48	99b
	" "		2687±459[2]				12	14	24c	3b	48	99c
	" "		2940±217[2]				37	14	24c	3b	48	99d
	Particulate organic matter from forest soil		2643±235[2]				43	14	24c	3b	48	100d
	" "		2275±599[2]				14	14	24c	3b	48	100c
III. Macroconsumers												
A. Aquatic *												
Protozoa (protozoans)												
Ciliophora												
	Tetrahymena pyriformis		5938±207[3]						1	8	18	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Porifera (sponges)												
Demospongia												
Monaxonida												
	Spongilla lacustris		6475±353[3]		58		4		1	3c	21	
	" "	1295				52.7	6	18	9a	7	50	102
Platyhelminthes												
Turbellaria												
Tricladida												
	Dugesia tigrina		2686±338[3]							8	18	45
	Phagocata gracilis woodworthi			1330±20[4]				18	9a	2a	22	
	P. gracilis		6377±137[2]				2	13	9a	3d	37	101
Coelenterata												
Hydrozoa												
Hydrida												
	Hydra littoralis		6034±146[3]							8	18	
	Chlorohydra viridissima		5729±247[3]							8	18	

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Anthozoa												
Alcyonaria												
	Duva multiflora (sea cauliflower)	2886		494		83	2	7	9b	3b	52	105
Mollusca												
Gastropoda												
Prosobranchia												
Mesogastropoda												
Naticidae												
	Natica clausa (little moon shell)	4392(0.1)[7]		791		82	2	7a	9b	3b	52	105
Neogastropoda												
Thaisidae												
	Thais lapillus (dog whelk)	4595(0.9)[7]		442		82	2	6	9b	3b	52	105a
	Thais lamellosa		5845±404[3]		8		4	4-7	9b	3c	21	
Opisthobranchia												
Tectibranchia												
Scaphandridae												
	Scaphander punctostriatus (striated canoe shell)	3336(0.9)[7]		418		90	3	7	9b	3b	52	105
Nudibranchia												
Polyceridae	Aegires albopunctatus		5309±929[3]		43		3	4-7	9a	3c	21	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Polycera atra		5680±439[3]		28		6	4-7	9a	3c	21	
	Triopha maculata		5641±393[3]		27		19	4-7	9a	3c	21	
	Hopkinsia rosacea		6007		43		7	4-7	9a	3c	21	
	Flabellina iodinea		4943		30		7	4-7	9a	3c	21	
Onchidoridídae												
	Acanthodoris rhodoceras		5439±645[3]		41		4	4-7	9a	3c	21	
Dorididae												
	Dendrodoris albopunctata		5158±480[3]		41		4	4-7	9a	3c	21	
Dironidae												
	Dirona picta		6675±1037[3]		41		4	4-7	9a	3c	21	
Aeolidiidae												
	Hermissenda crassicornis		6446±162[3]		28		9	4-7	9a	3c	21	
Bullidae												
	Bulla gouldiana		6352±315[3]		25		5	4-7	9b	3c	21	
Atyidae												
	Haminea virescens		6335±219[3]		27		6	4-7	9b	3c	21	
Aglajidae												

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Navanax inermis		5992±214[3]		36		11	4-7	9a	3c	21	
	N. inermis	923±14					4	4-7	16a	3c	20	
	Aglaja diomedea		5555±72[3]		27		7	4-7	9a	3c	21	
Pulmonata												
Stylommatophora												
Succincidae												
	Succinea ovalis		5415±600[3]						9b	8	18	
Polygyridae												
	Mesodon thyroidus		5971		22.8		1	7	9b	4	53	
Philomycidae												
	Philomycus carolinianus		4721(±39)[4]				2	15	10a	3b	54	106
	Oxytrema silicula	910				49.2				3c	31	82
Basommatophora												
Viviparidae												
	Viviparus dissimilis	1571			65.3	63.5	6	18	9a	7	50	102
Amnicolidae												
	Amnicola stenothyroides	1560			58.6	66.5	6	18	9a	7	50	102

Ecological and Systematic Position	Species Name	Gram Caloric Values			% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
		Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight								
Planorbidae												
	Planorbis indicus	502			71.2	49.6	6	18	9a	7	50	102
	Melanoides tuberculatus	424			74.6	42.8	6	18	9a	7	50	102
Pelecypoda (clams)												
Protobranchia												
Nuculanidae												
	Yoldia thraciaeformis	4783(0.5)[7]		509		89	3	8	9b	3b	52	105
	" "	4452(0.4)[7]		447			3	4	9b	3b	52	105
	Y. sapotilla	4778(0.4)[7]		688		88	3	7a	9b	3b	52	105
Eulamellibranchia												
Mytilidae												
	Modiolus sp.	4600±7					3		9b		9	63
Solenidae												
	Ensis minor (razor clam)		3500						10a		29	
Semelidae												
	Scrobicularia plana		5097±52[3]		12.2		60	18	9b	9	72	125

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Cardiidae												
	Clinocardium ciliatum	4453(1.2)[7]		374		92	3	7	9b	3b	52	105
Sphaeridae												
	Sphaerium sp.	3423±819[6]	4759±558[6]		27.3		2	7	9b	3d	5	85e
	Musculium sp.	5219					1	9	9b	3	36	89
Annelida (segmented worms)												
Polychaeta												
Aphroditidae												
	Aphrodita hastata (sea mouse)	3438(1.0)[7]		486		86	3	8	9a	3b	52	105
Nereidae												
	Lumbrinereis fragilis	4857(0.7)[7]		1059		78	3	7a	9a	3b	52	105
Nephthydidae												
	Nepthys ciliata	4061(0.7)[7]		747		81	3	8	9a	3b	52	105
Terebellidae	Undet. spp.	4141(0.6)[7]		805		80	3	6	9a	3b	52	105
Maldanidae												
	Axiothella sp.	3549(0.8)[7]		555		84	2	4	9a	3b	52	105

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Niochamache sp.	3561		618		83	1	4	9a	3b	52	105
	(Axiothella & Niochamache)	3276(0.3)[7]		653		80	3	8	9a	3b	52	105
Sternaspidae												
	Sternaspsis fossor	2127(0.8)[7]		538		75	3	6a	9a	3b	52	105
Amphictenidae												
	Pectinaria hypoborea	3242(1.2)[7]		624		81	3	7	9a	3b	52	105
	" "	3620(1.0)[7]		484		87	2	4	9a	3b	52	105
Flabelligeridae												
	Pherusa plumosa	2660(1.4)[7]		463		82	3	6b	9a	3b	52	105
	Strenelais articulata		4700						10a		29	
Sipunculida												
	Phascolion strombi	3389(0.3)[7]		595		82	2	7	9a	3b	52	105
Oligochaeta												
Plesiopora												
Naididae												
	Dero limosa	5530				97.6	6	18	9a	7	50	102

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Tubificidae												
	Limnodrilus hoffmeisteri			760 ± 26[4]				18	9a	2a	22	
	Limnodrilus sp.	5137 ± 863[6]					6	10b	10a	3	36	87
	Branchiodrilus semperi	7538				92.2	6	18	9a	7	50	102
	Undetermined	5436 ± 105[7]					4*		9a	4	81	
	" "	5435					4*		13w	4	81	
	" "	5340					4*		13x	4	81	
	" "	5180					4*		13y	4	81	
	" "	5492					4*		9a	4	82	
Megascolecidae												
	Megascolex mauritii	5081				83.4	6	18	9a	7	50	102
Hirudinea												
Erpobdellidae												
	Dina microstoma	5443					1	18	10a	3	36	90
Echinodermata												
Asteroidea												
Phanerozonia												

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Porcellanasteridae												
	Ctenodiscus crispatus (mud star)	1828(0.9)[7]		608		67		6		3	52	105
Foripulata												
Asteriidae												
	Asterias vulgaris (northern starfish)	2551(0.8)[7]		633		75	3	5a	9a	3	52	105a
	" "	2041(0.8)[7]		497		76	3	3	9a	3	52	105
Holothuroidea												
Dendrochirota												
Cucumaiidae												
	Cucumaria frondosa	3073(1.6)[7]		224		93	3	10	9a	3	52	105
Molpadonia												
Molpadiidae												
	Molpadia oolitica	1554(0.8)[7]		114		93	2	7	9a	3	52	105
	" "	1684(2.2)[7]		176		90	3	4	9a	3	52	105
Apoda												
Synaptidae												
	Chirodota laevis	2569(0.5)[7]		264		90	2	6	9a	3	52	105

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Echinoidea												
Diadematoidea												
Strongylocentrotidae												
	Strongylocentrotus droehbachiensis (green sea urchin)	883(0.7)[7]		287		68	3	3	9a	3	52	105
Arthropoda (jointed-leg animals)												
Crustacea												
Branchiopoda												
Anostraca												
	Artemia sp. (nauplii)		6737±863[3]						9a	8	18	
	Streptocephalus seali		4932±184[4] (3.72)[5]					8	9a	3c	1	49
Conchostraca												
	Undet. sp.		5205±116[4] (2.23)[5]					6	9a	3c	1	47
	Caenestheriella setosa		4360±270[4] (5.93)[5]					6	9a	3c	1	48
Cladocera												
Leptodoridae												
	Leptodora kindtii		5605±584[3]						9a	8	18	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	L. kindtii	5182.5	5434.4		4.6	96	1	14	10c	3d	5	86
	" "		4951(±155)[2]		8.6		6	9	9a	4	49	104a
	" "		4575(±149)[2]		5.1		2	8	9a	4	49	104b
	" "		4305		10.2		2	7	9a	4	49	104c
	" "		5151		5.5		4	8	9a	4	49	104c
	" "		4498		1.8		2	9	9a	4	49	104c
	" "	5385±49[4]	5452±50[4]		1.3		5	8c	10k	5	57	108
	" "	5242±61[4]	5307±62[4]		1.3		5	8c	10L	5	57	108
	" "	5235±43[4]	5301±43[4]		1.2		5	8c	10m	5	57	108
	" "	5165±56[4]	5230±56[4]				5	8c	9i	5	57	108
	" "	5437±45[4]	5504±46[4]		1.2		5	8c	10f	5	57	108
	" "	5626±72[4]	5694±73[4]				5	8c	10g	5	57	108
	" "	5722	5842				1	8c	16f	5	57	108
	" "	6150	6279				1	8c	16g	5	57	108
Daphnidae												
	Daphnia pulex var. pulicaria	4059.0±203[4]						17	9a	3c	6	50a
	" "	4124.0±229[4]						17	9a	3c	6	50b
	" "	5075.0±235[4]						17	9a	3c	6	50c

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	D. pulex		4478 ± 372^{4} $(8.31)^{5}$					6	10c	3c	1	60
	Daphnia pulex			256						7	77	128
	" "			371						7	78	128
	D. obtusa	4830.5 ± 25.5			8.5		4	18	10o	5	51	103a
	" "	5130.5 ± 219.3^{6}			6.4		5	18	10p	5	51	103a
	" "	5079.9 ± 159.5^{6}			7.0		4	18	10g	5	51	103a
	D. magna	5640 ± 60^{4}	5898 ± 63^{4}		7.4		5	8c	10h	5	57	108
	D. galeata mendotae	5118 ± 89^{4}	5511 ± 85^{4}		7.7		3	8c	10e	5	57	108
	" "	5372 ± 54^{4}	5817 ± 58^{4}		8.3		3	8c	10d	3	57	108
	" "	5850	6098		4.0		1	8c	16f	1	57	108
	D. spp.		4668 ± 364^{2}		11.1		5	9	10e	4	49	104a
	" "		4558		10.3		1	8	10e	4	49	104b
	" "		5643		7.6		1	10	10e	4	49	104b
	" "		4393		10.0		1	7	10e	4	49	104c
	" "		6071		5.5		1	8	10e	4	49	104c
	" "		5381 ± 752^{6}		11.5		4	9	10e	4	49	104c

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	D. spp.		4532±311[2]		6.3		5	9	10b	4	49	104a
	" "		5753		12.0		2	10	12g	4	49	104c
Bosminidae												
	Bosmina coregoni	5137±96[4]	5439±89[4]		5.9		3	8c	10e	5	57	108
	" "	5327±52[4]	5629±50[4]		5.7		3	8c	10d	5	57	108
Chydoridae												
	Chydorus sphaericus	5407±64[4]	5609±57[4]		3.6		5	8c	10h	5	57	108
Ostracoda												
Podocopa												
Cypridae												
	Stenocypris malcolmsoni	5683				65.1	6	19	9a	7	50	102
Copepoda												
Calanoida												
Diaptomidae												
	Calanus helgolandicus		5400±197[3]						9a	8	18	
	C. finmarchicus		5914					18	10c	3c	1	61

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Calanus hyperboreus		7432						10c		29	78
	C. finmarchicus		7380						10c		29	79
	Diaptomus articus		$5468 \pm 342^{4}_{5}$ (6.24)					6	11a	3c	1	52
	D. articus		$5526 \pm 277^{4}_{5}$ (5.02)					6	10c	3c	1	53
	D. articus eggs		5672					6	16b	3c	1	54
	D. siciloides		$5334 \pm 242^{4}_{5}$ (4.53)					7	11a	3c	1	55
	" "		$5643 \pm 75^{4}_{5}$ (1.32)					7	10c	3c	1	56
	D. leptopus		$5396 \pm 387^{4}_{5}$ (7.16)					6	11a	3c	1	57
	" "		$5436 \pm 214^{4}_{5}$ (3.93)					6	10c	3c	1	58
	D. siciloides	5605 ± 49^{4}	5849 ± 51^{4}		4.3		3	8c	10e	5	57	108
	" "	5877 ± 84^{4}	6149 ± 79		4.6		3	8c	10d	5	57	108
	Diaptomus sp.			550						7	78	128
	Trigriopus californicus		5555 ± 277^{3}						9a	8	18	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Cyclopoida												
Cyclopidae												
	Mesocyclops edax		5478±97[4] (1.75)[5]					7	11a	3c	1	59
	Cyclops vernalis	5690±58[4]	5819±51[4]		2.3		3	8c	10e	5	57	108
	" "	5885±54[4]	6037±59[4]		2.6		3	8c	10d	5	57	108
Cirripedia												
Thoracica												
	Balanus cariosus		5283±38[3]		13		4	4-7	9a	3c	21	
	Elminius modestus	5423±212[4]	5834±259[4]		7		4	14	14a	4	58	111
Malacostraca												
Amphipoda												
Talitridae												
	Hyalella azteca		3996		8.2		1	8	9a	4	49	104a
	" "		4079±199[6]		15.7		3	9	9a	4	49	104b
	" "		3819		22.9		1	8	9a	4	49	104c
	" "	4178±111[2]	5136±102[2]		20	90		7a	10a	3a	60	113
	" "	3850.4 ±109.9[4]	5188.4 ±205.7[4]		26.5		3	8	10a	3d	62	115c

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Hyalella azteca	4072.2 ±321.3[4]	5599.0 ±379.0[4]		27.3		5	8	9f	3d	62	115d
Gammaridae												
	Gammarus minus		5374±58[2]				6	13	9a	3d	37	101
	G. duebeni	4412.1 ±175[4]	5135.6 ±203[4]		26	74	5	15	10d	4	58	111a
	Crangonyx richmondensis occidentalis	3885.4 ±12.0[4]	5283.2 ±28.5[4]		26.4		4	8	10a	3d	62	115a
	" "	3853.2 ±37.8[4]	5655.3 ±343.6[4]		31.7		2	8	9f	3d	62	115b
	Crangonyx sp.			810				18	10a	2a	22	
	Amphipods	3761(0.6)[7]		1058		72	3	8	9a	3	52	105
Isopoda												
Asellidae												
	Asellus brevicaudus		4325±333[2]				2	13	9a	3d	37	101
Sphaeromidae												
	Sphaeroma rugicauda	3004±121	4553±231		56	75	7	13	11b	4	58	111

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Decapoda												
Ocypodidae												
	Uca pugnax (fiddler crab)	2791.7					2		9c		14	66
	U. pugnax	2841.8					2		9d		14	66
	" "	1909.6					2		9e		14	66
	U. pugilator (fiddler crab)	2076.6					2		9a		14	72
Xanthidae												
	Secarna reticulatum (mud crab)	2712.3					2		9a		14	72
	Panopius herbsti (mud crab)	1780.0					2		9a		14	73
	Pridium limnosum (mud crab)	1894.3					2		9e		14	71
	P. limnosum	1976.4					2		9c		14	71
Pandalidae												
	Pandalus montagui	4740(1.0)[7]		1320		72	3	7	9a	3	52	105
	" "	4747.0±155[4]	5923.8±202[4]		24	72	6	14	10c	4	58	111b
	" "	4442.3±324[4]	5634.0±469[4]		26	71	4	14	11a	4	58	111b

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Majidae												
	Hyas araneus (toad crab)	2610(1.0)[7]		348		87	3	3	9a	3	52	105
	Palaemon lamarne	5675				75.3	6	18	9a	7	50	102
	Palaemon serratus	4475.5±71[4]	5431.9±97[4]		18	74	10	14	10c	4	58	111b
	" "	4173.1±98[4]	5095.1±127[4]		18	75	7	14	11a	4	58	111b
	" "	4190.5±102[4]	5535.6±141[4]		24	73	6	14	9f	4	58	111b
	P. elegans	4018.7±194[4]	4795.4±266[4]		17	71	6	14	9f	4	58	111a
	Palaemonetes varians var. microgenitor	5142.0±63[4]	5816.9±85[4]		11.6		5	14	13d	4	58	111b
	" "	4910.9±121[4]	5612.0±147[4]		12.4		5	14	13e	4	58	111b
	" "	4515.2±92[4]	5272.2±117[4]		14.3		5	14	13f	4	58	111b
	" "	4590.2±87[4]	5395.2±105[4]		14.9		5	14	13L	4	58	111b
	" "	4169.7±74[4]	4944.0±93[4]		15.6		5	14	13j	4	58	111b
	" "	4101.2±68[4]	4863.8±86[4]		15.7		5	14	13u	4	58	111b
	" "	4155.2±85[4]	4997.3±98[4]		16.9		5	14	14a	4	58	111b
	" "	5060.0±98[4]	5410.0±120[4]		18	75	10	14	10c	4	58	111a
	" "	4470.1±142[4]	5073.2±164[4]		18	75	10	14	11a	4	58	111a
	" "	4310.0±162[4]	4569.0±184[4]		19	74	10	16	9f	4	58	111a

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Hippolytidae												
	Hippolyte varians	4162.1±173[4]	4735.1±215[4]		15	76	5	16	10c	4	58	111a
Astacidae												
	Cambarus robustus	3266.7 ±469.9[6]	4502.1 ±623.2[6]		27.6		6	7	9a	3d	5	85
	Cambarus immunis	3914					1	7	10a	3	36	88
	C. tenebrosus		5164				1	13	10u	3d	37	101
	" "		4780				1	13	10s	3d	37	101
	Orconectes rusticus		4808±2[2]				1	13	10s	3d	37	101
	Pacifastacus leniusculus	3442±95[4]	4612±98[4]		25.4	80	5	15	11d	5	59	
	" "	8937±328[4]	9309±345[4]		4	85	3	16	16a	5	59	
Parastacidae												
	Cherax albidus		5040±224[4]		7.8	72	5	13	10a	3c	61	114a
	" "		6423		2.3	39	1	13	16h	3c	61	114
	Immature crayfish		4427±370[4] (8.29)[5]					6	13a	3c	1	71

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Insecta												
Ephemeroptera												
Heptageniidae												
	Stenonema pulchellum	5295±259[4]					5	17	13a	3c	8	62a
	S. pulchellum	5398±108[4]					6	17	13a	3c	8	62b
	" "	5552±130[4]					6	17	13a	3c	8	62c
	" "	5710±91[4]					6	17	13a	3c	8	62d
	" "	5975±71[4]					6	17	13a	3c	8	62e
	Epeorus pleuralis		6205±31[2]				3	13	9a	3d	37	101
	E. pleuralis		6226				1	13	10i	3d	37	101
Baetidae												
	Baetis sp.		6409				1	13	9a	3d	37	101
	Cloeon sp.			878						7	78	128
	" "			1370						7	77	128
Ephemeridae												
	Ephemera expectance	4885				85	6	18	9a	7	50	102

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Caenidae												
	Caenis sp.		7130		4.8		1	9	13a	4	49	104a
	" "		6985		0.0		1	8	13a	4	49	104c
Odonata												
Zygoptera (Damselflies)												
Lestidae												
	Lestes malabaricus	4956				79.65	6	18	9a	7	50	102
Agrionidae												
	Pyrrhosoma nymphula	5124.8±25.9[2]			5.4		33	18	13a	5	51	103
	" "	5270.5±18.2[2]			4.7		24	18	13c	5	51	103
	" "	5445.9			2.9		6	18	13v	5	51	103
	" "	5292.1±24.9[2]			4.4		10	18	13v	5	51	103
	" "	5583.4±27.9[2]			3.5		10	18	10v	5	51	103
	" "	5583.4			2.4		3	18	11a	5	51	103
	" "	5817.4			2.2		3	18	10b	5	51	103
	Argia vivida	5075±61[2]	5936		14.5		13	5d	13a	3c	84	
Anisoptera (Dragonflies)												
Libellulidae	Plathemis hydra	5098±101[2]	5860		13.0		6	5d	13a	3c	84	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Gomphidae												
	Megalogomphus superbus	3034				81.55	6	18	9a	7	50	102
Coleoptera (beetles)												
Hydrophilidae												
	Enochrus carinatus	5371±54[2]	5908		9.1		7	5d	10a	3c	84	
Trichoptera (caddisflies)												
Limnophilidae												
	Pycnopsyche antica	3539.6 ±99.2	5195.9 ±912.1		31.2		6	1	13a	3d	5	65
	P. guttifer		5706				1		13a	8	18	
	P. lepida		5687±530[3]						13a	8	18	
	Neophylax oligius	5683.7 ±235.0[6]	5982.0 ±390.1[6]		4.9		3	7	13a	3d	5	85a
Hydropsychidae												
	Hydropsyche slossonae	5604.7[6] ±29.1	6375.0 ±842.3[6]		11.7		2	7	13a	3d	5	85b
	Macronema pseudoneura	5167				81.19	6	13	9a	3d	37	101
Megaloptera (dobson flies, fish flies, alder flies)												
Corydalidae												
	Nigronia serricornis	5210.27 ±263.0[6]	5375.15 ±253.1[6]		5.9		2	7	13a	3d	5	85c

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Diptera												
Chironomidae (=Tendipedidae)												
	Calopsectra (=Tanytarsus) dives			690±20[4]			12	18	13a	2a	22	
	Anatopynia dyari			880±56[4]			6	18	13a	2a	22	
	Harnischia tenuicaudata	5344.5						18	13a	3	24	
	Tanypus stellatus	5607.5						18	13a	3	24	
	Chironomus plumosus	5843.6						18	13a	3	24	
	" "			504						7	78	128
	" "			549						7	77	128
	C. (Limnochironomus) tenuiforceps	5890				73.8	6	18	9a	7	50	102
	Chironomidae larvae	5273				85.8	1	13	13a	3c	31	82
	" "	5516.0 ±260.2[6]			10.4		4	13	13c	5	51	103
	" "		6050±129[4]		6.5		6	15	13g	4	56	107

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Chironomidae larvae	5014±3.3[7]					4*		9a	4	81	
	" "	4902 -					4*		9a	4	82	
	Glyptotendipes sp.		5622±129[2]		3.1		3	8	13a	4	49	104a
	" "		4979		6.1		1	8	13a	4	49	104b
	" "		5321		4.9		1	8	13a	4	49	104c
	" "		5135±395[6]		6.3		4	11	13a	4	49	104c
	" "		5023		0.0		1	7	12a	4	49	104b
Simuliidae (black flies)												
	Simulium spp.		5521				1	13	13a	3b	37	101
Culicidae (mosquitos and phantom midges)												
	Chaoborus (=Corethra) plumicornis			439						7	77	128
	Chaoborus (Undet.)	4936					4*		9s	4	81	
Stratiomyidae												
	Hedriodiscus truquii	2470±97[2]	4750		48.0		16	5d	13a	3c	84	
		2726±63[2]	5096		46.5		21	5d	13f	3c	84	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Hedriodiscus truquii	2669±73[2]	5560		42.0		29	5d	13g	3c	84	
	" "	4927±102[2]	5375		10.0		13	5d	10a	3c	84	
	" "	764±91[2]	3185		76.0		8	5d	12f	3c	84	
	" "	5845±231[2]	5964		2.0		2	5d	16a	3c	84	
	" "	681±113[2]	4544		85.0		2	5d	24a	3c	84	
Brachyopoda												
	Glottidia pyramidata		4397 ±2140[3]						9a	8	18	
Chordata												
Vertebrata												
Chondrichthyes												
	Raja orinacea (skate)		5600						16a		29	

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Osteichthyes (bony fishes)												
Poeciliidae												
	Lebistes reticulatus (guppie)		5823				1			8	18	
Cottidae												
	Cottus bairdii (slimy muddler)	3952.1 $\pm 81.0^6$	5102.4 $\pm 344.2^6$		22.5		3	1	9a	3d	5	85d
	C. perplexus	5287				76.5				3c	31	82
Centrarchidae												
	Lepomis machrochirus (bluegill)	3719.5 $\pm 32.4^6$	4973.9 $\pm 280.2^6$		25.8		3	7	9a	3d	5	46
	L. macrochirus	5102							16a			38
	" "	5820							16e			38
	L. gibbosus (pumpkin seed)	4065.7 $\pm 47.1^6$	5285.9 $\pm 177.0^6$		25.8		3	7	9a	3d	5	46
Gobiidae												
	Gobius giuris	3880				74.6	6	18	9a	7	50	102
Cyprinidae												
	Barbus conchonius	2878				75.9	6	18	9a	7	50	102

Ecological and Systematic Position	Species Name	Gram Caloric Values			% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
		Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight								
	<u>Rhinichthys atratulus</u> (blacknose dace)	7285±340[2]					3	13	9a	3d	37	101
	" "	6540					1	13	10t	3d	37	101
	" "	6342					1	13	10d	3d	37	101
Labridae												
	<u>Tautogolabrus adspersus</u> (cunner)	4880		1058			1		9a	3	52	105
Clupeidae												
	<u>Clupea harengus</u> (herring)	6360		1927			1		9a	3	52	105
Salmonidae												
	<u>Oncorhynchus keta</u> (chum salmon)	3606[1]	3745[1]	1597[1]	3.72	55.7	7	8d	18h	7	83	130a
	<u>O. nerka</u> (migratory) (sockeye or red)	3446[1]	3580[1]	1369[1]	3.73	60.3	3	10	18h	7	83	130c
	" " " (resident)	3345[1]	3479[1]	1292[1]	3.81	61.4	3	10	18h	7	83	130c
	<u>O. garbusha</u> (pink salmon)	4043[1]	4187[1]	1687[1]	3.44	58.3	4	8d	18h	7	83	130a
	" " "	3599[1]	3732[1]	1565[1]	3.56	56.5	6	9	18h	7	83	130b

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	O. tschawytscha (king salmon)	3649[1]	3740[1]	1363[1]	2.45	62.6	1	8	18h	7	83	130d
	O. kisutch (silver salmon or coho)	3446[1]	3592[1]	1381[1]	4.07	59.9	4	10	18h	7	83	130c
	O. masu	3767[1]	3905[1]	1719[1]	3.55	54.4	11	8d	18h	7	83	130f
	" "	3464[1]	3588[1]	1566[1]	3.48	54.8	5	8d	18h	7	83	130g
	Salmo salar (Atlantic salmon)	3660[1]	3827[1]	1473[1]	4.35	59.8	21	9	18h	7	83	130b
	Salmo salar (Baltic salmon)	3557[1]	3723[1]	1395[1]	4.45	60.8	6	10	18h	7	83	130e
B. Terrestrial												
Platyhelminthes												
Turbellaria												
	Bipalium kewense		5684±124						9a	8	18	
Annelida												
Oligochaeta												
Opisthopora												
Lumbricidae												

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Lumbricus terrestris	4125.6±57[4]					2	15	9a	3b	54	106
	L. sp.	5012	5628	782	0.8	84.4	1	14	9a	3a	55	112
Arthropoda												
Crustacea												
Isopoda (sowbugs, pillbug, wood louse)												
Armadillidiidae												
	Armadillidium vulgare	2605±9.2[2]			66		3	17	10a	3d	64	
	A. nasatum	3324			67		1	17	10a	3d	64	
Oniscidae												
	Metoponorthus pruinosus	3790			72		1	17	10a	3d	64	
	Cylisticus convexus	3355±5.3[2]			67		3	17	10a	3d	64	
	" "	6123±9.7[2]			45.2		3	17	10a	3d	64	
	Tracheoniscus rathkei	3521.07 ±28.06[2]					21	18	10a	3	35	
Myriopoda												
Chilopoda												

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Scolopendromorpha												
Cryptopidae												
	Otocryptops sexspinosus (centipede)		5344		7.2		1	7	10a	4	64	
Diplopoda												
Polydesmida												
Xystodesmidae												
	Brochoria initialis (millipede)		5453		55		1	9	10a	4	64	
Arachnomorpha												
Arachnida												
Acarina												
Acaridae												
	Tyroglyphus interna		5808±446[3]						9a	8	18	
Lycosidae												
	Pirata piraticus (wolf spider)	4886±96[2]	5265		7.2		4	5d	10a	3c	84	
Tetragnathidae												
	Tetragnatha versicolor (orb weaver)	5164±136[2]	5613		8.0		4	5d	10a	3c	84	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Phalangida (=Opiliones)												
Phalangiidae (harvestman, daddy long legs)												
	Leiobunum flavum		5732		6.9		1	7	9a	4	64	
Araneae												
Gnaphosidae												
	Drassyllus virginiana		5794±89[2]		3.8		2	9	9a	4	64	
Insecta												
Collembola												
Entomobryidae												
	Tomocerus sp.		6063		8.7		1	10	10a	4	64	
Hemiptera												
Cercopidae (spittle bugs)												
	Phinaenus spumarius	6307	6503		3.1		2	15	16a	8	29	77a
	" "	4575±576[4]	4976±376[4]		8.1		4	13	13d	8	29	77b
	" "	5274±38[4]	5674±66[4]		7.0		4	13	13a	8	29	77b
	" "	5452±160[4]	5801±154[4]		6.1		4	13	13f	8	29	77b
	" "	5528±44[4]	5780±103[4]		4.3		4	13	13g	8	29	77b

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Phinaenus spumarius	5713±88[4]	5902±91[4]		3.2		4	13	13h	8	29	77b
	" "	5525	5575		0.9		1	6	11a	8	29	77c
	" "	5951	5999		0.8		1	7	11a	8	29	77c
	" "	5909	5950		0.7		1	8	11a	8	29	77c
	" "	5752	5758		0.1		1	8	11a	8	29	77c
	" "	5767	5784		0.3		1	9	11a	8	29	77c
	" "	5779	5808		0.5		1	9	11a	8	29	77c
	" "	5498	5575		1.4		1	9	11a	8	29	77c
	" "	5525	5625		0.2		1	6	10c	8	29	77c
	" "	5951	6108		0.4		1	7	10c	8	29	77c
	" "	5909	6016		0.3		1	8	10c	8	29	77c
	" "	5752	6116		1.0		1	8	10c	8	29	77c
	" "	5767	5858		0.1		1	9	10c	8	29	77c
	" "	5779	5950		2.1		1	9	10c	8	29	77c
	" "	5498	5791		1.8		1	9	10c	8	29	77c
	" "	5187	5187				1	13	12f	8	29	77b
	Neophilaenus lineatus		5440±427[2]		7.76		2	4a	13d	5	66	117
	" "		5478±357[2]		8.88		3	4a	13e	5	66	117

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Neophilaenus lineatus		5791±131[2]		6.95		5	4a	13f	5	66	117
	" "		5799±155[2]		6.79		6	4a	13g	5	66	117
	" "		5911±177[2]		5.24		6	4a	13h	5	66	117
	" "		5514±10[2]		1.99		2	6	11a	5	66	117
	" "		5760		1.40		1	7	11a	5	66	117
	" "		6022		2.10		1	8	11a	5	66	117
	" "		5429		2.60		1	9	11a	5	66	117
	" "		5654±237[2]		2.01		5	6c	11a	5	66	117
	" "		6160±2[2]		1.36		2	6	10c	5	66	117
	" "		5825±13[2]		0.89		2	7	10c	5	66	117
	" "		5728±30[2]		1.17		2	8	10c	5	66	117
	" "		5556±20[2]		0.37		2	9	10c	5	66	117
	" "		5817±236[2]		0.95		8	6c	10c	5	66	117
Dictyoptera												
Blatteria												
Blattellidae												
	Blattella germanica (cockroach)	5347	5511		3.0	73	1*	17	13d	3c	63	121
	" "	4963±21[4]	5190±22[4]		4.4	69.3	2	17	13e	3c	63	121

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Blattella germanica (cockroach)	5291	5519		4.2	67.6	1	17	13f	3c	63	121
	" "	5415 ± 10^4	5673 ± 11^4		4.8	66.9	2	17	13g	3c	63	121
	" "	5423	5682		4.6	67.1	1	17	13h	3c	63	121
	" "	5447	5689		4.1	69.3	1	17	13k	3c	63	121
	" "	4836 ± 7^4	5079 ± 6^4		5.0	71	2	17	11a	3c	63	121
	" "	5762	5946		3.1	69.2	1	17	10n	3c	63	121
	" "	5350	5590		4.3	69.1	1	17	10r	3c	63	121
	" "	5046 ± 7^4	5262 ± 7^4		4.1	70.9	2	17	10c	3c	63	121
	" "		6709				1	17	16i	3c	63	121
	" "	6348	6564		3.3		1	17	16j	3c	63	121
	" "	5488.4 ± 22^4					2	14	9a	3b	54	106
	" "	5425.1 ± 18^4					3	14	10a	3b	54	106
	" "	4793 ± 11^4					2	17	24b	3c	63	121
	Parcoblatta sp. (woodroach)	5422 ± 95.2^2			4.0		2	9	10a	4	44	
Orthoptera												
Acridoidea												
Acrididae (grasshoppers)												
	Melanopus femurrubrum	5151.7					3		10a		14	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Melanopus femur-rubrum	5388±120[4]			2.1		4	14	9a	5	65	116
	M. bileratus	5018±60[4]			2.4		2	14	9a	5	65	116
	Mixed M. femur-rebrum and M. bileratus	4466±170[4]			2.4		5	14	9a	5	65	116
	Schistocerca americana	5155.1					2		13a		14	
	S. americana	5281.7					1		10a		14	
	Chorthippus parallelus		4804±88[2]		2.70		3	5b	15a	4	67	117
	" "		5320±153[2]		2.20		3	5b	15b	4	67	117
	C. parallelus		4363±169[2]		2.73		3	5b	15c	4	67	117
	" "		5541±45[2]		2.62		2	5b	15d	3b	67	117
	" "		5131±169[2]		2.20		3	5b	15e	4	67	117
	" "		5354±110[2]		2.14		3	5b	15f	4	67	117
	" "		4544±187[2]		2.96		3	5b	15g	4	67	117
	" "		5596±20[2]		2.31		3	5b	15h	3b	67	117
	" "		5449±26[2]		2.00		4	5b	11a	3b	67	117
	" "		5638±32[2]		1.92		5	5b	10c	3b	67	117
	" "		5492±10[2]		2.33		2	5b	10c	3b	67	117

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	C. parallelus		5933±20[2]		3.66		3	5b	16a	4	67	117
Grylloidea												
Gryllidae												
	Acheta domesticus		5896		5.7		1	17	10a	4	44	
Tettigonoidea												
Tettigoniidae (long-horned grasshoppers)												
	Orchelimum fidicinum (salt marsh grasshopper)	5035.3					1	9	13a		14	64a
	O. fidicinum	5301.9					1		13a		14	64b
	" "	5797.7					2		13a		14	64c
	" "	5479.6					2		11a		14	64
	" "	5699.2					2		10c		14	64
	" "	5590					4	14	10a	3b		83a
	" "	5033					1	14	13a	3b		83b
	" "	5302					1	14	13a	3b		83c
	" "	5798					2	14	13a	3b		83d

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Hymenoptera												
Formicidae												
	Crematogaster sp. (carpenter ants)	4856.3 ±114.9[4]					12	15	17b	4	68	
	" "	6143.9 ±140.7[4]					10	15	17c	4	68	
	" "	2646.3 ±128.4[4]					6	15	17d	4	68	
	Camponotus americanus		6247		2.8		1	7	10a	4	44	
Apidae												
	Apis mellifera (honey bee)	4867.7±28[4]					2	14	17b	3b	54	106
Coleoptera (beetles)												
Tenebrionidae (grain beetles)												
	Tenebrio molitor (meal worm)		6314±516[3]						13a	8	18	
	T. molitor	6578.9						17	13a	3c	23	67a
	" "	4858.1						17		3c	23	67b
	" "	4978.0						17		3c	23	67c
	" "	6000.0						17	13a	3c	23	67d

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	T. molitor	6844	6987	2758	0.5	59.7	1	17	13a	3a	55	112
	T. sp.			2330			3		13a	3b	71	124
	" "			2210			3		12a	3b	71	124
	" "			1960			3		10a	3b	71	124
Coccinellidae (ladybird beetles)												
	Megilla maculata	5926.3 ±59.24					18	10a	10a	3	35	86
Elateridae (click beetles, wireworms)												
	Melanotus rufipes	5303.9					2	14	16a	4	69	118
	" "	4323.2					2	18	13m	4	69	118
	" "	5014.1 ±12.8[2]					3	18	13n	4	69	118
	" "	5635.6 ±8.4[2]					3	18	13o	4	69	118
	" "	5715.2 ±6.0[2]					3	18	13p	4	69	118
	" "	5086.9 ±15.9[2]					3	18	13q	4	69	118
	" "	5873.8 ±17.7[2]					3	18	13r	4	69	118

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Melanotus rufipes	6280.5 ±20.8[2]					3	18	13s	4	69	118
	" "	6523.8 ±9.3[2]					3	18	13t	4	69	118
	" "	4729.6					1	18	24a	4	69	118
	" "	5453.4 ±2.6[2]					3	18	12f	4	69	118
	" "	4846.3 ±17.9[2]					3	14	11a	4	69	118
	" "	5932.0 ±6.8[2]					4	14	10c	4	69	118
Carabidae (ground beetles)												
	Evarthrus sodalis		5672		3.2		1	7	10a	4	44	
Chrysomelidae (leaf beetles)												
	Chrysochus auratus (milkweed beetle)	5227	5537		5.6	60		7	10a	3b	44	
Diptera												
Drosophilidae												
	Drosophila melanogaster	5796.6					1	17	13a	3d	5	88

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Sarcophagidae (flesh flies)												
	Sarcophaga bullata		5914						12d		29	
	" "		5399						12e		29	
	" "		5079						10v		29	
Calliphoridae (blow flies)												
	Calliphora erythrocephala	5768.1±6.2[2]					4	17	13a	4	69	118
Insecta												
	Mixed insects	5820									25	
Chordata												
Vertebrata												
Amphibia												
	Rana pipiens (leopard frog)		6000						22b		29	
	" "		5800						23a		29	
	Rana hexadactyla	1638				89.1	6	19	23b	7	50	102
	Ambystoma punctatum		6000						22a		29	

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Reptilia												
Squamata (lizards)												
Tguanidae												
	Urosaurus ornatus (Texas tree uta)		6400						22a		29	
	Scleroporus undulatus (common swift, fence swift)		6700						22a		29	
Chelonia (turtles)												
Emydidae												
	Pseudemys scripta (terrapins)		6600						22a		29	
Crocodilia (alligators, crocodiles)												
Crocodylidae												
	Alligator missippiensis (American alligator)	5040		1050			8		21a	3b	70	122
Aves												
Chardriiformes (shorebirds, gulls and auks)												

Table 3

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Laridae (Gulls)												
	Larus argentatus (Herring gull)	4430		2170			3		20a	3b	70	122
	" "	4320		2040			3		20d	3b	70	122
	" "	4360		1680			3		20e	3b	70	122
	" "	4330		1850			3		20g	3b	70	122
Columbiformes												
Columbidae												
	Streptopelia risoria (Ring dove)	5060		960			5		20a	3b	70	122
	" "	4820		1050			4		20b	3b	70	122
	" "	4700		1540			4		20c	3b	70	122
	" "	4820		1910			3		20f	3b	70	122
	" "	4890		2010			4		20h	3b	70	122
	" "	5000		2260			34		18a	3b	70	122
	Zenaidura macroura (Mourning dove)	5140 ± 20^2		2610 ± 100^2			6		18a		73	
Galliformes												
Phasianidae												

Ecological and Systematic Position	Species Name	Gram Caloric Values			% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
		Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight								
	Gallus domesticus (domestic chicken)	4760		1610			3		20a	3b	70	122a
	" "	4510		1710			3		20i	3b	70	122a
	" "	4710		1800			3		20j	3b	70	122a
	" "	4760		1810			2		20L	3b	70	122a
	" "	4680		1750			2		20m	3b	70	122a
	G. domesticus (Red Junglefowl)	4800		1480			3		20k	3b	70	122b
Numididae												
	Numida meleagris (Domestic Guinea Fowl)	4840		1380			4		18a	3b	70	122
Cucuiformes												
Cuculidae												
	Coccyzus americanus (yellow-billed cuckoo)	7840	8120						18a	3b	28	76b
	" "	4950	5630						18e	3b	28	76b
Passeriformes												
Parulidae												

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	<u>Dendroica striata</u> (black poll warbler)	8100	8310					10	18a	3b	28	76b
	" "	4990	5640					10	18e	3b	28	76b
	<u>Parula americana</u> (parula warbler)	7680	7960					10	18a	3b	28	76b
	" "	4730	5350					10	18e	3b	28	76b
	" "	6950	7440					3	18a	3b	28	76c
	" "	4820	5570					3	18e	3b	28	76c
	" "	5200	5720					3	18a	3b	28	76c
	" "	4020	4560					3	18e	3b	28	76c
	<u>Prothonotaria citrea</u> (prothonotary warbler)	6840	7360					4	18a	3b	28	76c
	" "	4830	5590					4	18e	3b	28	76c
	" "	6700	7290					4	18a	3b	28	76c
	" "	4800	5640					4	18e	3b	28	76c
	<u>Helmitheros vermivorus</u> (worm-eating warbler)	9210	9250						18f	36	28	76a

Ecological and Systematic Position	Species Name	Gram Caloric Values			% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
		Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight								
	<u>Helmitheros vermivorus</u> (worm-eating warbler)	8830	8860						18f	36	28	76a
	" "	8930	8960						18f	36	28	76a
	<u>H. mustelina</u> (Blackburnian warbler)	8700	8750						18f	36	28	76a
	" "	8830	8900						18f	36	28	76a
	<u>Piranga</u> <u>olivacea</u> (scarlet tanager)	7570	7900						18a	3b	28	76b
	" "	4490	5170						18e	3b	28	76b
	" "	7580	7890						18a	3b	28	76b
	" "	4680	5310						18e	3b	28	76b
	" "	6780	7240						18a	3b	28	76c
	" "	4490	5160						18e	3b	28	76c
	" "	6020	6510						18a	3b	28	76c
	" "	4520	5100						18e	3b	28	76c
	" "	5210	5750						18a	3b	28	76d
	" "	4390	4950						18e	3b	28	76d

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	P. rubra (summer tanager)	6690	7410						18a	3b	28	76c
	" "	4890	5600						18e	3b	28	76c
	" "	6780	7270						18a	3b	28	76c
	" "	4880	5630						18e	3b	28	76c
Icteridae												
	Dolichonyx oryzivorus (bobolink)	7880	8190						18a	3b	28	76a
	" "	4860	5660						18e	3b	28	76b
	" "	8940	9140						18f	3b	28	76a
Turidae												
	Hylocichla ustulata (Swainson thrush)	8040	8290						18a	36	28	76b
	" "	4910	5610						18e	36	28	76b
	" "	8880	8940						18f	36	28	76b
	H. fuscescens (veery)	7760	8020						18a	36	28	76b
	" "	4360	4960						18e	36	28	76b
	" "	6950	7450						18a	36	28	76c

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	H. fuscescens (veery)	4850	5630									
	H. mustelina (wood thrush)	7780	8060						18a	3b	28	76b
	" "	4970	5620						18e	3b	28	76b
	" "	7670	8010						18a	3b	28	76b
	" "	4990	5730						18e	3b	28	76b
	" "	5990	6660						18a	3b	28	76c
	" "	4850	5630						18e	3b	28	76c
Mimidae												
	Toxostoma rufum (brown thrasher)	5700	6360						18a	3b	28	76c
	T. rufum	4770	5510						18e	3b	28	76c
	Mimus polyglottos (mockingbird)	5490	6180						18a	3b	28	76d
	" "	4860	5600						18e	3b	28	76d
	Dumetella carolinensis (cat bird)	8940	9080						18f	3b	28	76a
	" "	9230	9290						18f	3b	28	76a

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
Troglodytidae												
	Telmatodytes palustria griseus (salt marsh wren)	5990	6630						18a	3b	28	76d
	" "	4420	5170						18e	3b	28	76d
Fringillidae												
	Pipilo erythrophthalmus (towhee)	6190	6870						18a	3b	28	76d
	" "	4750	5580						18e	3b	28	76d
	" "	5520	6240						18a	3b	28	76d
	" "	4810	5580						18e	3b	28	76d
	Passer domesticus (English sparrow)	5570	6320						18a	3b	28	76d
	" "	4740	5560						18e	3b	28	76d
	" "	5500	6110						18a	3b	28	76d
	" "	4740	5400						18e	3b	28	76d
	Richmondena cardinalis (cardinal)	6020	6730						18a	3b	28	76d
	" "	4720	5580						18e	3b	28	76d

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Per gram ash-free dry weight	Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Richmondena cardinalis (cardinal)	5530	6290						18a	3b	28	76d
	" "	4780	5600						18e	3b	28	76d
Vireonidae												
	Vireo flavifrons (yellow-throated vireo)	5040	5650						18a	3b	28	76d
	" "	4520	5150						18e	3b	28	76d
Corvidae												
	Cyanocitta cristata (blue jay)	5090	5960						18a	3b	28	76d
	" "	4670	5570						18e	3b	28	76d
	12 species-bird egg yolk		8000±100[3]						22a		29	80
Mammalia (mammals)												
Chiroptera (bats)												
	Lasiurus cinereus (hoary bat)			4380			3	17	24b	3b	71	124
Rodentia (rodents)												
Cricetidae												

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Microtus pennsylvanicus (meadow vole)	4491.1					3		18j		12	68
	" "	4667.6					3		18j		12	68
	" "	4815.8					3		19b		12	68
	" "	4626.0					3		18j		12	68
	" "	4787 ± 179[2]					3	5	22d	3c	40	123
	" "	4985 ± 35[2]					2	9	22d	3c	40	123
	" "	4090 ± 110[4]						5	18k	3c	40	123
	" "	4560 ± 20[4]						9	18k	3c	40	123
	" "	4250 ± 500[4]						10	18k	3c	40	123
	" "	4010					1	5	18j	3c	40	123
	" "	4990 ± 990[4]						10	18j	3c	40	123
	" "	5270 ± 350[4]						11	18j	3c	40	123
Muridae												
	Mus musculus (white laboratory mice)	4500.6						17	19d		12	69
	" "	5967.7						17	18a		12	69
	" "	6010.3						17	19d			

Ecological and Systematic Position	Species Name	Gram Caloric Values: Per gram dry weight	Gram Caloric Values: Per gram ash-free dry weight	Gram Caloric Values: Per gram wet weight	% Ash	% H_2O	Number samples	Season	Stage, sex, parts	Methods	Author & Source	General Notes
	Mus musculus (white laboratory mice)	6223.3						17	18a			69
	Thomomys talpoides (pocket gopher)		5870				3				16	35a
	" "		5733				3				16	35b
	" "		5903				3				16	35c
IV. Miscellaneous Materials												
Benzoic Acid		6318									27	
Millipore filters			3104.6 ± 37^4 $(1.19)^5$							3c	1	75a
" "			2935.2							3c	1	75b
" "			3046 ± 85^4		0.0		3			5	57	
Mineral Oil			10,921							3c	21	
Snail food		4058				76.8				3c	31	82
No. 5 gelatin capsules		4631									55	
Commercial trout pellet		4683	5084								55	119
Cellulose extract		1219	2617								55	120
Cockroach food			4523 ± 1^4				2				63	121a

Notations

I. Superscript notations for caloric value error terms

1. Value calculated from data reported by the author
2. Standard error
3. 95% confidence limitis (two standard deviations)
4. Standard deviation
5. Coefficient of variation
6. Plus or minus the range, i.e. difference between high and low values
7. % deviation from the mean

II. Season material was collected

1. January
2. February
3. March
   3a. March through April
4. April
   4a. April through September
   4b. April, July, August, November
   4c. April, August, November
   4d. April through May
5. May
   5a. May and June
   5b. May through September
   5c. May and November
   5d. May to October
6. June
   6a. June and August
   6b. June through August
   6c. June through September
   6d. June through July
   6e. June through October
7. July
   7a. July through August
8. August
   8a. August through September
   8b. August through October
   8c. August through November
   8d. August and September
9. September
10. October
    10a. October through May
    10b. October, December through May, July
11. November
    11a. November through March
12. December
13. Spring
14. Summer
15. Fall
16. Winter

17. Laboratory culture
18. Throughout the year

III. Life stage, sex and parts of organisms used

A. Bacteria, algae, protozoa, sponges
   1. Entire cells or colonies of cells or loosely grouped cells (marine algae)

B. Fungi
   2a. hyphae and sporulating portions
   2b. sporulating portions
   2c. spores
   2d. hyphae

C. Mosses, liverworts, lichens, ferns
   3a. entire plant
   3b. thallus
   3c. non-spore bearing portions
   3d. capsules with spores

D. Gymnosperms
   4a. entire plant
   4b. needles
   4c. stem
   4d. flowers
   4e. cones, with seeds
   4f. seeds
   4g. roots
   4h. twigs
   4i. pollen

E. Angiosperms
   5a. entire plant
   5b. stems, leaves, fruits, flowers (all above ground parts)
   5c. stems, leaves (above ground parts, except fruits and flowers)
   5d. stems, leaves and flowers
   5e. stems, leaves and fruits
   5f. stems
   5g. roots
   5h. stems, leaves and seeds
   5i. twigs
   5j. xylem
   5k. roots, stems, leaves, flowers
   5l. roots, stems, leaves, fruits
   5m. roots, stems, leaves
   5n. roots, stems, leaves, flowers
   5o. bark
   5p. entire young plants

   6a. leaves
   6b.—6d. sized green leaves: b = small; c = medium; d = large

   7a. flowers
   7b. male flowers
   7c. female flowers
   7d. bracts
   7e. receptacle plus peduncle
   7f. nectar
   7g. pollen

   8a. fruits
   8b. seeds

8c. hulled seeds
8d. seeds and flowering heads
8e. pericarps

F. Invertebrates

9a. entire animals of varying stages (age classes or sizes) and both sexes (or age and sex not specified)
9b. entire animals without shells (Mollusca)
9c.—9e. entire animals of both sexes (or sex not specified) grouped into general size categories: c = small; d = medium; e = large
9f. immature (i.e. not sexually mature) stages (non-arthropod groups)
9g. immature males
9h. immature females
9i. entire male animals, all stages

10a. adults, both sexes (or sex not specified)
10b. adult females, reproductive
10c. adult females, non-reproductive
10d. adult females with eggs (eggs and embryos at various stages of development, or stage not specified)
10e. adult females without eggs
10f. females with summer eggs
10g. females with winter eggs
10h. females with and without eggs, mixed
10i. subimagos, both sexes (Ephemeroptera)
10j. female subimagos
10k.—10m. various size classes, females without eggs: k = 2—5 mm; l = 6—7 mm; m = 10—12 mm
10n. V instar females
10o. non-reproductive adults $<$ 1.5 mm (sex not determined)
10p. females $>$ 1.5 mm with eggs (or young)
10q. females $>$ 1.5 mm without eggs (or young)
10r. VI instar females
10s. adults without chelipeds, both sexes (or sex not specified)
10t. adults, cephalothorax (and appendages) only
10u. adults, cephalothorax, without chelipeds
10v. newly emerged adults

11a. adult males, reproductive
11b. adult males, non-reproductive
11c. male subimagos (Ephemeroptera)
11d. 7 cm males

12a. pupae, all stages and sexes (or sex and stage not specified)
12b. male pupae
12c. female pupae
12d. prepupae (same designations as for 12a.)
12e. 11 day pupae
12f. molted exoskeleton
12g. chitin

13a.—13u. larvae (or nymphs) of both sexes (or sex not specified) grouped according to various size (stage, age or instar) categories:

a. = various sizes (or size and age not specified)
b. = early stages
c. = late stages
d. = instar I
e. = instar II
f. = instar III
g. = instar IV
h. = instar V
i. = stage VA
j. = stage VB
k. = instar VI
l. = instar VII
m. = instar VIII

n. = instar IX
o. = instar X
p. = instar XI
q. = instar XII
r. = instar XIII
s. = instar XIV
t. = instar XV
u. = post larval (nymphal) stages

13v. just prior to emergence (nymphs) or pupation (larvae)

13w.—13.y. reared in an aquarium from eggs
w. = one month
x. = two months
y. = three months

14a. naupliar stages (specific instars not specified)

14b.—14g. copepodite stages
b. = I
c. = II
d. = III
e. = IV
f. = V
g. = V, fat only

15a.—15d. male larval (nymphal) stages (or instars)
a. = I
b. = II
c. = III
d. = IV

15e.—15h. female larval (nymphal) stages (or instar)
e. = I
f. = II
g. = III
h. = IV

16a. eggs (and embryos, various stages of development, or stage not given)
16b. egg sacs with eggs
16c. ovaries with eggs
16d. newly fertilized eggs
16e. yolk only
16f. summer eggs
16g. winter eggs
16h. eggs, no development
16i. oöthecae, newly laid
16j. oöthecae, fully developed
16k. embryos various stages (or stage not given), but some development completed

17a.—17e. social insects
a. = all castes
b. = workers
c. = soldiers
d. = reproductive males (kings)
e. = reproductive females (queens)

G. Vertebrates

18a. adults, all sizes (or ages) and both sexes (or sex not specified)

18b.—18c. sexually mature adults
b. = males
c. = females

18d. fat extracted adult females

18e. fat extracted adults (size and sex as in 18a).

18f. adult body fat (size and sex in 18a.)

18g.—18h. breeding adults
g. = males
h. = females

18i. adult females with eggs (eggs and embryos at various stages of development or stage not specified)

18j.—18k. non-reproductive adults
j. = males
k. = females

19a. immatures (or juveniles), all sizes (or ages) and both sexes (or sex not specified)
19b. immature males
19c. immature females
19d. immature (not sexually mature)

20a.—20m. ages in days
a. = 1
b. = 8
c. = 18
d. = 19
e. = 26
f. = 28

g. = 37 j. = 60 m. = 180
h. = 38 k. = 65
i. = 46 l. = 92

21a. ages in months
a. = 7

22a. eggs (and embryos, various stages of development, or stage not specified)
22b. newly fertilized eggs
22c. yolk only
22d. embryos, various stages (or stages not specified) but some development completed

23a. 144 hr tadpoles
23b. tadpole larvae (hours or days of development not specified)

H. Detritus (+ microconsumers)
24a. feces, larval (nymphal) or juvenile
24b. feces, adult
24c. particulate organic matter
24d. dead leaves
24e. dead twigs (or stems)
24f.—24h. sized dead leaves
f. = small h. = large
g. = medium

IV. Methods of analysis

1. not given (left blank in the table)
2. wet digestion (specific technique not given)
2a. dichromate digestion method (MACIOLEK, 1962)
3a.—3d. Parr oxygen bomb (Parr Instrument Co., Moline, Illinois)
a. macrobomb non-adiabatic
b. macrobomb adiabatic
c. semi-microbomb non-adiabatic
d. semi-microbomb adiabatic
e. peroxide bomb
4. Phillipson microbomb
5. Gentry-Wiegert bomb (Modified Phillipson bomb) Gentry-Wiegert Instruments, Aiken, South Carolina
6. BERTKELAT bomb
7. Values calculated from organic analysis (protein, i.e. nitrogen, and/or lipid, and/or carbohydrate — the latter usually by difference)
8. MCEWAN & ANDERSON miniature bomb
9. GALLENHAMP ballistic bomb calorimeter
10. Unknown oxygen bomb calorimeter

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VI. General notes

1. Ash considered insignificant so no correction was made. A total of 68.31 mg burned.
2. Ash considered insignificant so no correction was made; cells were from culture. A total of 42.88 mg burned.
3. Caloric value less cellulose.
4. Value given is a mean of 3482.0 and 3507.0; Twin Ponds, Crawford Co., Pennsylvania (Pa.).
5. Plants collected from Twin Ponds, Crawford Co., Pa.
6. Stems: mean of 4183.0 and 4141.9. Leaves: mean of 3482.0 and 3507.0 Twin Ponds, Crawford Co., Pa.
7. Richman's algae values for *Chlamydomonas* measured with cultured material, approximately 250 mg benzoic acid + 50 mg sample. All other values calculated from reference no. 7 on the basis of % C, H, O and N in green algae.
8. Bliss (reference 10) gives % lipid values for most species, these ranged from 0.21 to 7.03; ash values ranged from 0.0 to 3.2%, usually under 1.5%; duplicate samples gave errors of between 0.0 to 1.9% usually only two (occasionally three) determinations were made. The only ash values given in the tables for Bliss's data are the unusual ones for which he presented the values for the particular species. All material collected from Mt. Washington, New Hamphsire.
9. Samples taken in an old field dominated by *Trideus flavus* near Athens, Georgia (Ga.).
10. Collected in the vicinity of Champlain, Illinois.
11. Collected in Grand Forks Co., North Dakota.
12. Collected in an abandoned field near East Lansing, Michigan (Mich.), dominated by *Poa compressa*. All above ground parts used for analysis.
13. Average of four normal young plants per plot.
14. Average of four normal mature plants per plot.

15. Collected along an altitudinal transect in the Beartooth Mts., Wyoming (Wyo.). The elevations of the collection stations are as follows: a = 7,400 ft., b = 8,400 ft., c = 10,000 ft.
16. See note no. 10; also one sample was run with crushed seeds, one with whole seeds and the results averaged.
17. See note no. 8; also, the ash value is for *C. bigelowii* roots.
18. Value for normal sunlight plot in light intensity experiments.
19. Value when subjected to short day (6 hrs. light) experiment.
20. See note no. 11; seeds taken from the crops of mourning doves.
21. Value given is a mean of 4229.0 and 4186.0.
22. Maximum value in nutrient study when plot was fertilized with twice normal amount of "commercial fertilizer used by gardeners" and watered to twice normal density of the soil solution.
23. Value when subjected to short day (5 hrs. light) experiment.
24. Value when subjected to long day (13 hrs. light) experiment.
25. See note no. 10; also one sample consisted of crushed seeds, the other whole seeds, one sample was analyzed by 3b and the other by 3c (see methods notes).
26. Value when not fertilized or watered.
27. Average of four plants per plot in competition experiments.
28. Plants grown in loam; maximum value from experiment to test effect of soil on caloric content.
29. The top leaf of an experimental plant, dry wt. 3.7 gm.
30. Bottom leaf of same plant (note 29 above), dry wt. 1.7 gm.
31. Caloric value for all leaves of same plant (note 29), dry wt. 117.3 gm.
32. Dry wt. of stem of above plant (note 29), 204.4 gm.
33. Dry wt. of roots of above plant (note 29), 87.5 gm.
34. Dry wt. of head of above plant (note 29), 169.6 gm.
35. Pocket gopher *Thomamys talpoides*. Stomach contents taken along an altitudinal transect in the Beartooth Mts., Wyo. The altitudes were as follows: a = 7,400 ft., b = 8,400 ft., c = 10,000 ft.
36. Values from Bliss (reference 10) obtained by averaging the data, in the plant categories shown, from two collection times. June 25—27, 1959, and Aug. 14, 1959. (Also see note 8.) Additional data are presented (Bliss, reference 10) which compare caloric values for plant parts with entire plants in a selected species and caloric values showing seasonal variations in 5 selected species.
37. See note no. 12. Sample of all vegetation in a plot. Vegetation ground in a Wiley Mill and aliquots taken for analysis.
38. Samples of all herbaceous plants treated as described in note no. 37.
39. Composite sample of all roots in old field plot dominated by *Poa compressa*. Samples treated as described in note no. 37.
40. Data from composite samples of alpine tundra on Mt. Washington, New Hampshire (1958). Dominant species of the sedge meadow was *Carex bigelowii*.
41. Data from composite samples of alpine juncus-heath on Mt. Washington, New Hampshire (1958). Dominant species: *Juncus trifidus, Vaccinium uliginosum, V. vitis-idaea* var. *minus* and *Potentilla tridentata*.
42. Cells cultured in 5% glucose medium, Dept. Biol., Univ. Pittsburgh. Culture grown until carbon source exhausted, washed and centrifuged twice.
43. Detritus collected in a riffle area of Linesville Creek, Crawford Co., Pa. Material washed before drying. (Note the roots were primarily *Salix*.)

44. Ground litter under the community on a 4-year old abandoned field; composed primarily of woody forbs *(Happlopapus)* and some grasses.
45. Well fed on *Artemia nauplii* prior to analysis.
46. Pymatuning Reservoir, Crawford Co., Pa. Dried material ground in Wiley Mill and subsampled.
47. 229 animals 2—3 mm in length, 148.20 mg burned.
48. 39 animals 4—7 mm in length, 187.26 mg burned.
49. 8 animals 10—15 mm in length, 243.77 mg burned.
50. Cultured in the laboratory, Dept. Zoology, Univ. Mich. Values are given for three age classes: a = 0.7 mm, b = 1.3 mm, c = 1.8 mm.
51. Collected in the San Diego-La Jolla, California area.
52. 500 animals 2.34 mm in length, 58.32 mg burned.
53. 500 animals 2.80 mm in length, 64.06 mg burned.
54. 500 egg sacs 0.15 mm in length, 10.97 mg burned.
55. 8500 animals 0.75 mm in length, 33.09 mg burned.
56. 12,500 animals 0.95 mm in length, 61.30 mg burned.
57. 3000 animals 1.45 mm in length, 91.84 mg burned.
58. 2100 animals 1.70 mm in length, 56.99 mg burned.
59. 2100 animals 0.85 mm in length, 48.37 mg burned.
60. 2000 animals 1.92 mm in length, 72.31 mg burned.
61. 2000 females taken monthly April, 1962 through March, 1963 at Millport, Scotland. The range was from 5232 in August to 6626 in October (the value given is the mean for the year).
62. Mayfly nymphs reared in laboratory culture. Determinations made in five age categories. a = 4 mm, b = 5 mm, c = 6 mm, d = 7 mm, e = 8 mm.
63. Animals collected at Sapelo Is., Ga.
64. Marsh grasshoppers collected at Sapelo Is. The three nymph size classes and numbers used (in parentheses) were as follows: a = 5—10 mm (20), b = 10—15 mm (3), c = 15—20 mm (3). For measurements in which animals were not sized, 6 individuals used.
65. Collected in marginal, riffle and intermediate areas of the woodland section of Linesville Creek, Crawford Co., Pa. All terminal instar larvae, still actively feeding.
66. Crabs collected at Sapelo, Is., Ga.; numbers used in each size class as follows; small = 66, medium = 32, large = 3.
67. Laboratory cultures were the source of animals. Animals in the following condition or given the following treatments were used: a = mixed larvae from culture, b = fat extracted larvae, c = exoskeletons, d = fat-ladened 4th instar larvae.
68. *Microtus* trapped in an old field near East Lansing, Mich. The first 2 adult males weighed 39.1 and 24.5 gm. The juvenile male weighed 10.0 gm and the last adult male weighed 28.0 gm. The males were killed with ether, immediately minced and lyophilized.
69. White laboratory mice from Dept. Bacteriology, Mich. State Univ. Only the heads were used in the analyses of adults. Live weights of the four mice were 19.0, 33.0, 12.8 and 33.4 gm respectively. Treatment of tissue as described in note no. 68.
70. Material collected on George Reserve, Mich., in an old field community. The values given are the high and low measured.
71. 6 animals 10—20 mm in length, 42.44 mg burned.
72. 3 crabs collected at Sapelo Is., Ga.
73. 2 crabs collected at Sapelo Is., Ga.

74. 1 crab collected at Sapelo Is., Ga.
75. Values for compressed (pellet) millipore filters. 75a = 5 μ filters; 75b = 0.45 μ filters. When the sample size was larger than 30 mg, individual measurements approached the mean by ±7 to ±17 cal/gram.
76. Caloric determinations were made on 32 specimens of 20 species. The caloric values were presented in four categories.
    a. Values for body fat only (bulk extraction) catbird, worm-eating warbler, Blackburnian warbler; (soxhlet extraction) Marsh wren, Swainsons thrush, bobolink, worm-eating warbler (2nd and 3rd values).
    b. Values for very fat, fall migrant birds. Black-poll warbler, Swainson thrush, veery, bobolink, yellowbilled cuckoo, wood thrush, Parula warbler, scarlet tanager.
    c. Values for spring migrants arriving at the Gulf coast after flights from wintering grounds in Tropical America. Parula warbler, summer tanager, veery, scarlet tanager, prothonotary warbler, wood thrush.
    d. Values for nonmigrants (permanent residents or migrants during nonmigrating seasons). Salt marsh wren, towhee, cardinal, brown thrasher, English sparrow, scarlet tanager, mockingbird, yellow-throated vireo, blue jay.
77. Material oven dried at 100° C and subsamples muffle furnace ashed at 600° C. Material collected in the area of the E. S. George Reserve, University of Michigan.
    a. Fully developed eggs dissected from females collected in 1960.
    b. Larvae collected 1961.
    c. Adults collected 1960; collection dates in the order the pairs of entries (i.e. male and female) appear in the table are as follows: 6/27, 7/14, 8/2, 8/16, 9/5, 9/13, 9/27.
78. Data presented by SLOBODKIN from R. CONOVER (Woods Hole, personal communication).
79. Data presented by SLOBODKIN from MARSHALL and ORR (personal communication).
80. The species of birds used to obtain the pooled value of bird egg yolk were as follows *Angelains phoeniceus, Archilochus colubris, Colinus virginianus, Dendroica petechia, Gallus domesticus, Leipoa ocellata, Melospiza melodia, Molothrus ater, Passer domesticus, Phasianus culchicus, Rhea americana, Riparia riparia.*
81. All samples were analyzed in duplicate. The average difference between plant samples was 31 cal/ash-free gm, and 46 cal/ash-free gm between soil samples.
82. The following notes are from reference 30 (DAVIS & WARREN, 1965) and concern the species composition of brood categories given in the caloric table. Midge larvae: "Midge larvae of the genus *Chironomus* were the most numerous of the insect forms. The midges *Tanytarsus, Polypedilum* and *Brillia* were usually present." *Chironomus* size classes fed to sculpins were 20—35 mg; those fed to stoneflies were 1—5 mg. Stonefly nymphs: "*Nemoura* was the only observed plecopteran." Snail food: 1 part powdered whole milk, 2 parts powdered wheat germ, 2 parts sodium alginate, 20 parts fresh algae *(Spirogyra)*. Algae: "... the algal community that developed was usually dominated by species of the filamentous alga *Oedogonium* and the diatoms *Synedra ulna* and *Melosira varians.*"
83. Marsh grasshoppers collected at Sapelo Is., Ga. adults (a) and three nymph sizes, (b) 5—10 mm, (c) 10—15 mm, (d) 15—20 mm, were burned. The salt marsh grass, *Spartina,* was also collected at Sapelo Is., Ga.
84. *E. coli* grown in mass culture with glucose as the carbon source. Cells removed after glucose judged to have been used up. Cells washed five times, centrifuged and desiccated.
85. Linesville Creek, Crawford Co., Pa. riffle section no. 27.
    a. Terminal instar larvae in pupal cases.
    b. Terminal instar larvae still actively feeding.

c. Several size classes.
d. Dried material ground with mortar and pestle and subsampled.
e. Animals removed from shells with a fine scalpel. Size classes 4 (shell length 9.0—11.9 mm) and 5 (12 mm and greater).

86. Beetles collected during hibernation and shortly thereafter.

87. *Limnodrilus*. Samples ranged from 240 to 674 individuals per sample. Dry wt./ind. averaged 0.00078 gms. Sample weights ranged from 0.1661 to 0.4873 gm dry wt. Calories/ind. averaged 4.0.

88. *Cambarus*. 2 individuals used to make up the sample material. Sample wt. 1.4120 gm. Cal./ind. 2764. Dry wt./ind. 0.706 gm.

89. *Musculium*. Sample 355 individuals, dry wt. 0.1657 gm. Cal./ind. 2.4. Dry wt./ind. 0.00047 gm.

90. *Dina*. Sample 891 individuals, dry wt. 0.4982 gm. Cal./ind. 2.3. Dry wt./ind. 0.00056 gm.

91. Taken at peak standing crop biomass of the population in 1966. Growth was under conditions of extreme drought in an old field in New Jersey.

92. Taken at peak standing crop biomass of the population in 1967. Growth was under conditions of abnormally great moisture in an old field in New Jersey.

93. Dried at 100° C for 24 hrs. Collected 1967—1968.
a. First year stage.

94. Duplicate 1 gram samples used.
a. Woody tissue samples collected after leaf abscission included bark, xylem, twigs, roots (carefully scraped). Mixed wood tissue samples from these four components of each of eight trees harvested during previous study = "composite tree".
b. Water soluble material removed.
c. After 4 weeks in litter.
d. After 26 weeks in litter.

95. Needles taken from trees growing on a river terrace at 5,400 ft. (Alberta, Canada).
a. Frozen, air dried.
b. Frozen, alcohol dried.

96. Tall form of S. *alterniflora*.
a. Stunted form of S. *alterniflora*.
b. Salt panne area of marsh.
c. Flat marsh of an estuary.

97. Collected in marine habitats in the state of Washington.
a. Friday Harbor.
b. Mukkaw Bay.
c. Waddah Island.
d. Lloyds Boat House, Seattle.

98. Material dried for 48 hrs. at 100° C; ground in a hand-operated coffee mill and then with mortar and pestle; desiccated for several days. All collections from the George Reserve, University of Michigan, and old field studied extensively by F. C. Evans.

99. Particulate organic matter from old field soils. Six particle sizes (44—105, 105—210, 210—297, 297—500, 500—1190 and > 1190 micron diameters) were separated from each of three depths (0—10, 10—20, 20—30 cm). Averages and standard errors were calculated by the authors; sample number varied between 2 and 3 for the original data.
a. 0—10 cm depth
b. 10—20 cm depth
c. 20—30 cm depth
d. average of all depths

100. Particulate organic matter from forest soils. Particle sizes and depths as given for 99 above.
   a. 0—10 cm depth
   b. 10—20 cm depth
   c. 20—30 cm depth
   d. average of all depths
101. Morgan's Creek, Meade County, Kentucky.
102. A study of community metabolism in a tropical pond. Towel dried wet wt. determined; oven dried at 100° C for 24 hrs.; cooled to room temperature in a desiccator. Methods used by TEAL (1957; ref. 22) were employed to calculate the caloric values from % nitrogen data.
103. Dried to constant weight in a vacuum oven at 60° C; agate ground, % ash determined from bomb residue.
   a. Laboratory cultures (maintained in lab for 2 yrs.), fed yeast and dried milk.
104. Cladocerans collected with a high speed tow net (no. 000); amphipods and chironomids hand collected from *Myriophyllum* in Lake Mendota. Oven dried at 60° C for 24 hrs., desiccator stored, ground in agate mortar. Chitin samples obtained by digestion in 5% KOH. Ash determinations in a muffle furnace at 600° C (12 hrs.). Material collected at various seasons over a three year period.
   104a = 1965, 104b = 1966, 104c = 1967
105. Collections from St. Margarets Bay and Bedford Basin (indicated as 105a), Nova Scotia. Invertebrates larger than 0.5 mm from grab samples and beam trawl at 25 meters or > depth. All mollusca data are without shells. Material dried to a constant wt. 75° C, ground (20 mesh sieve size). Sulfur determinations and corrections made. $CaCO_3$ determinations made and a correction of 0.137 cal/mg made (PAINE, 1966).
106. Oven dried at 65° C.
107. Ash % determined from bomb residue. Larvae raised in the lab on Hartz Mountain Dog Kisses.
108. Ash % determined from independent samples muffle furnace combusted for 2 hrs. at 500° C. All animals collected from Sanctuary Lake, Crawford Co., Pa. (part of Pymatuning Reservoir), a shallow eutrophic system. Oven dried at 60° C for 24 hrs. and desiccator stored. *Leptodora* were separated into sex and size categories fresh, the remainder of the zooplankton from frozen samples.
109. Determinations and original collection site as in 108. Culture raised on slants of tryptone glucose extract agar. Subcultures made on brain-heart infusion, incubated for 18 hrs., 1 ml added to 200 ml brain-heart infusion agar. After 9 hrs. (terminal point of log phase), centrifuged and washed (3 times) and filtered (Millipore filter, 0.45 μ pore size). Filter caloric value subtracted to obtain bacterial value.
110. Determinations and original collection site as in 108. Percent composition by cell numbers: *Volvox* = 59.28, *Microcystis* = 17.00, *Pediastrum* = 13.05, *Melosira* = 2.52, *Anabaena* = 2.08, *Pleodorina* = 2.05, *Aphanizomenon* = 1.92, *Pandorina* = 1.49, *Scenedesmus* = 0.56, *Ceratium* = 0.05. Cells held in culture prior to filtration for calorimetry. Filter value subtracted to obtain algal value.
111. Estuarine crustaceans and British coastal prawns collected 1967 (111a) and 1968 (111b).
112. Laboratory culture.
113. Dried animals compressed into pellets; 400—800 μg/individual dry weights (some juveniles prohably included).
114. Material freeze dried, milled and homogenized. Ash determined separately on subsamples at 480° C. Caloric content corrected (1%—2%) for endothermy due to calcium carbonate. Ash values based on 28 samples, water content on 32 animals. a = 30—40 mm carapace length.

115. Material dried at 100° C and ground; ash determined from bomb residue. Animals collected from Marion Lake, Univ. British Columbia Research Forest; < 1.0 meter depth, soft ooze bottom, very sparse rooted aquatic vegetation. Median head widths (mm) and range (±mm) are given below
a. 1.043 ± 0.485 (note: 5 samples burned to obtain cal/gm values)
b. 0.739 ± 0.153
c. 0.645 ± 0.330 (see note for a)
d. 0.398 ± 0.128

116. For collection site see note 77. Material dried in a vacuum oven at 60° C, ground in an electric mortar and pellets made. Feces collected from grasshoppers held in cages and fed fresh *Lespedeza cuneata* leaves.

117. Collections made with suction sweep net on grassy heathland in S. W. England (Devon). Material dried in a vacuum oven at 60° C for at least 24 hrs., stored in desiccators over silica gel. Ash determined from bomb residue.

118. Material dried to constant weight at 60° C, ground, pelleted and redried.

119. Commercial pellet, Diamond "s", 1/8 inch; Simpson and Co., Colorado Springs, Colorado.

120. Cellulose extracted from *Chara* with 10% NaOH; 6.8% of wet weight or 36.9% of dry weight.

121. Cultures held at 28° C ± 1° C and 70%—80% relative humidity. Freeze dried, dried to constant weight over $CaCl_2$. Ash % determined on replicate samples muffle furnace combusted at 480° C for 24 hours. No correction for endothermy made. a. Food consisted of equal parts wheat germ and cane sugar.

122. Tissue homogenized in a "Toledo" meat grinder, dried to constant weight at 40° C. Dried residue fat extracted with petroleum ether. Remaining lean-dry biomass then calorimeter combusted. Live wt. caloric values calculated assuming 9000 cal/gm of extracted fat. Values entered under cal/gm are all lipid-free. The number of individuals analyzed equals the number of samples given in the table with the following exceptions: *L. avgentatus* = 1; *G. domesticus* = 1 for 46 day age and >; *N. meleagris* = 1; *A. missippiensis* = 2. a. Athens random-bred strain; b. red junglefowl.

123. Homogenized in a Waring blender, lyophilized. Animals captured 1967—1968.

124. Feces collected during 20 days study of food intake and utilization of a male adult. Feces and food dried to a constant weight at 40°C in vacuum oven prior to combustion.

125. Each of 15 replicates represented 4 samples combusted so the total number is given as 60. Maximum range throughout the year was ± 411 cal/ash-free gm. Each sample was prepared from animals homogenized (50 at a time) and dried for 48 hrs. in a vacuum oven.

126. Collected from marsh at Cedar Creek Natural History Laboratory, Bethel, Minnesota. Material oven dried.

127. Values attributed to reference 76 represent data calculated from literature information on organic analyses (fat, protein, i.e. nitrogen, and carbohydrate), % ash and % water. STRAŠKRABA corrected all dry weights to estimated "absolute" values that would be obtained by drying at 105° C (60° C, 5% correction; air dried, 10% correction). Nitrogen content was converted to protein by calculation. The original references from which the data were calculated can be obtained by consulting STRAŠKRABA (reference 76). Since STRAŠKRABA presented ranges of caloric values for most species the data are given as medians ± the range.

128. The values cited under GENG (reference 77) and JABLONSKAJA (reference 78) were taken from STEFFENS, W., 1960. Ernährung und Wachstum des jungen Zanders (*Lucioperca lucioperca* [L.]) in Teichen. — *Z. Fischerei* **9**, 161—271.

129. Autumn-shed leaves of elm *(Ulmus americana)*, alder *(Alnus rugosa)*, oak *Quercus alba)* were cut into 1 cm diameter discs and leached in stream water for three days.
    a. Leaf discs run at 10° C without addition of nutrients.
    b. Leaf discs run at 20—22° C without addition nutrients.
    c. Leaf discs run at 10° C with the addition of 20 mg/l N and 5 mg/l P.
    d. Leaf discs run at 20—22° C with the addition of 20 mg/l N and 5 mg/l P.
    e. Leaf discs run at 10° C with the addition of 20 mg/l N and 5 mg/l P.
    f. Leaf discs run at 10° C with the addition of 20 mg/l N, 5 mg/l P and antifungal-antibacterial antibiotics.
    g. Leaf discs run at 10° C with the addition of 20 mg/l N, 5 mg/l P and antifungal antibiotics.
    h. Leaf discs run at 10° C with the addition of 20 mg/l N, 5 mg/l P and antibacterial antibiotics.
    i. Run at 10° C without nutrient addition.
    j. Run at 10° C with the addition of nitrogen.
    k. Run at 10° C with the addition of *Hyalella* (dried and crushed).
    l. Run at 20—22° C without nutrient addition.
    m. Run at 20—22° C with the addition of nitrogen.
    n. Run at 20—22° C with the addition of *Hyalella* (dried and crushed).

130. One hundred eggs for analysis were taken from body cavity of each female (with the exception of the *O. tschawytscha* whose eggs were analyzed after the beginning of segmentation) and were dried on filter paper, placed in a weighing bottle, weighed and dried to constant weight in an incubator at 70° C. After extraction with ethyl alcohol, the fat content was determined in a Soxhlet apparatus. Total nitrogen was estimated by a semi-micrometric KJELDAHL method. Ash content was determined after incineration in a muffle furnace at 300—500° C. All estimates made twice. The caloric values for the eggs are calculated from the physiological heat equivalents for protein (4.1 Kcal/g) and fat (9.3 Kcal/g).
    a. Collected in 1959 and 1960 from the Bol'shaya Takaya River.
    b. Obtained from the Taibolsk fish factory on the Kola River in the Murmansk region in 1961.
    c. Obtained from the Dal'nyaya River and Lake Dal'nce in the basin of the Paratunka River in 1961.
    d. Obtained from the upper reaches of the Paratunka River in 1957.
    e. Collected from the West Dvina River in 1961 at the Tome fish factory.
    f. Collected in 1959 from the Bol'shaya River.
    g. Collected in 1960 from the Bol'shaya River.

131. Values for particulate organic matter from various trophic lake types.
    a. Oligotrophic
    b. Mesotrophic
    c. Eutrophic
    d. Eutrophic-Dystrophic
    e. Dystrophic

E. SCHWEIZERBART'SCHE VERLAGSBUCHHANDLUNG
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