

REPORT OF NIH BIOMEDICAL RESEARCH AND TRAINING IN NUTRITION, FY 2007

THE LEADER IN FEDERALLY SUPPORTED NUTRITION RESEARCH AND TRAINING

In Fiscal Year 2007, the NIH continued to lead Federal agencies in financial support of nutrition research and training, with a total of \$1.1 billion. This total represents the combined individual contributions of the 19 NIH institutes, four centers and the Office of the Director (OD) that supported biomedical nutrition research and training. Actual

obligations for FY 2007 biomedical nutrition research and training for NIH institutes and centers (ICs) are shown in Table 1 as amounts and as percentages of their total obligation.

Leading the ICs in total dollars expended in support of nutrition research were NIDDK, NCI and NHLBI, collectively accounting for two-thirds of the total NIH nutrition related spending.

**Table 1. Actual Obligations, NIH Biomedical Nutrition Research and Training,
as a Percentage of Total ICD Obligations, by NIH Component, FY 2007
(in thousands of dollars)**

Institute / Center (IC)	Nutrition Research and Training*	Total IC Obligations**	Nutrition as Percentage of Total IC Obligations
NCI	244,993	4,795,491	5.1
NHLBI	219,121	2,919,180	7.5
NIDCR	9,339	389,807	2.4
NIDDK	283,255	1,856,026	15.3
NINDS	5,402	1,534,904	0.4
NIAID	12,654	4,366,445	0.3
NIGMS	3,784	1,935,625	0.2
NICHD	62,664	1,254,144	5.0
NEI	14,555	666,675	2.2
NIEHS	21,993	641,773	3.4
NIA	42,557	1,046,500	4.1
NIAMS	6,348	508,060	1.2
NIDCD	3,924	393,540	1.0
NIMH	19,588	1,403,570	1.4
NIDA	2,966	1,000,014	0.3
NIAAAA	18,711	436,057	4.3
NINR	7,306	137,287	5.3
NHGRI	324	486,427	0.1
NIBIB	320	298,391	0.1
NCRR	49,525	1,143,841	4.3
NCCAM	60,170	121,379	49.6
NCMHD	2,221	199,429	1.1
FIC	1,725	66,422	2.6
OD ⁺	16,363	956,235	3.5
TOTAL⁺⁺	1,109,808	28,557,222	3.9

* Actual obligations. Source: Human Nutrition Research and Information Management (HNRIM) System database. Funding reported via HNRIM are not considered official NIH numbers.

** Obligations. Source: NIH Office of Program Planning and Evaluation.

+ Office of the Director (OD) includes Office of Dietary Supplements, Office of Behavioral and Social Sciences Research and NIH Roadmap.

++ Total excludes obligations for National Library of Medicine and buildings and facilities. Research, Condition, and Disease Categorization (RCDC) system total is \$1,075 million due to changing categorization methods.

Leading NIH components in terms of the percentage of total IC budget dedicated to nutrition research and training were NCCAM, NIDDK and NHLBI, with 50 percent, 15 percent and 8 percent, respectively, for FY 2007.

Actual obligations for nutrition research and training by NIH component during the past 10 years are shown in Table 2. The trend in current dollars was steadily upward for most ICs during the first half of this period. The more recent leveling of nutrition related expenditures reflects the end of the NIH budget doubling period between 1998 and 2003.

TRENDS IN NUTRITION RESEARCH AND TRAINING, 1998-2007

Table 2. Actual Obligations for Nutrition Research and Training by NIH Component, Fiscal Years 1998-2007 (Thousands of Dollars)^a

NIH Component	1998	1999 ^b	2000	2001	2002	2003 ^c	2004	2005	2006	2007
Total	494,443	553,519	694,909	789,269	916,964	1,035,343	1,033,304	1,082,475	1,067,454	1,109,808
NCI	119,829	113,223	171,491	184,535	204,425	228,797	226,990	241,493	228,552	244,993
NHLBI	118,886	124,233	130,491	146,592	184,367	193,795	194,222	204,228	206,975	219,121
NIDCR	6,755	9,109	9,261	10,671	10,148	9,547	9,367	9,336	8,816	9,339
NIDDK	105,026	130,115	151,007	182,613	203,741	231,671	230,750	242,816	269,293	283,255
NINDS	4,032	3,870	9,048	10,358	10,150	10,139	10,587	6,901	7,845	5,402
NIAID	12,355	13,907	16,115	17,631	16,806	24,608	19,972	13,803	11,216	12,654
NIGMS	2,120	2,088	2,854	2,326	2,340	2,843	3,623	3,543	3,558	3,784
NICHHD	28,401	35,029	41,602	45,549	50,957	56,818	50,738	53,628	58,322	62,664
NEI	15,665	17,438	20,796	23,724	26,891	21,032	20,253	15,432	14,555	14,555
NIHHS	7,078	6,615	10,839	14,286	22,644	23,680	23,962	27,694	26,819	21,993
NIA	20,763	26,720	31,380	42,579	55,990	61,970	61,453	62,737	53,980	42,557
NIAMS	4,569	4,544	4,531	2,984	3,366	2,928	4,262	7,359	8,140	6,348
NIDCD	2,514	1,757	1,610	1,478	2,881	2,734	3,316	3,627	3,309	3,924
NIMH	7,363	7,450	11,782	15,153	18,941	18,945	20,015	20,729	21,192	19,588
NIDA	1,980	3,450	4,100	4,492	5,093	4,111	3,318	1,963	2,204	2,966
NIAAA	7,632	8,089	9,424	7,790	9,869	11,663	14,074	16,677	15,614	18,711
NINR	2,775	3,434	4,487	5,134	5,862	7,231	5,187	5,124	6,684	7,306
NHGRI	-	-	-	1,287	1,362	3,279	226	183	336	324
NIBIB	-	-	-	-	-	343	340	-	293	320
NCRR	26,345	31,759	34,431	35,032	37,479	42,913	49,568	53,254	53,363	49,525
NCCAM	-	10,305	28,985	34,394	42,369	53,301	54,550	55,059	51,727	60,170
NCMHD	-	-	-	-	-	7,116	8,661	11,141	10,524	2,221
FIC	354	382	676	663	1,282	2,767	2,264	1,898	1,594	1,725
OD	-	-	-	-	-	13,111	15,606	23,851	2,544	16,363

a. Funding reported via HNRIM are not considered official NIH numbers.

b. In FY 1999 includes funding for the National Center for Complimentary and Alternative Medicine.

c. Beginning in FY 2003, Office of the Director (OD) includes Office of Dietary Supplements and Office of Behavioral and Social Sciences Research.

As shown in Table 3, total NIH expenditures for nutrition research and training have increased consistently since FY 1998 and have constituted approximately 4 percent of total NIH obligations during that period. This table also shows total NIH biomedical nutrition research and training support in constant, as well as current dollars. For example, nutrition research and training support showed a \$614 million, or 136 percent, increase between FY 1998 and FY 2007 in current (unadjusted) dollars. In constant dollars (i.e., adjusted for inflationary price increases), nutrition research and training support in FY 2007 represented a 72 percent increase over the FY 1998 level.

In FY 2006, the latest year for which data for other agencies are available, the NIH continued to lead all Federal agencies in financial support of nutrition research and training with a total of \$1.1 billion, as shown in Figure 1.

Table 3. Actual Obligations, NIH Biomedical Nutrition Research and Training, in Current and Constant Dollars, and as a Percentage of Total NIH Obligations FY 1998-2007 (in thousands of dollars)

Fiscal Year	Nutrition Research and Training, Current Dollars*	Nutrition Research and Training, Constant Dollars**	Total NIH Obligations ⁺	Current Nutrition Dollars as a Percentage of Total NIH Obligations
1998	494,443	494,443	12,777,283	3.9
1999	553,519	536,532	14,710,791	3.8
2000	694,909	649,383	16,843,082	4.1
2001	789,269	713,829	20,068,232	3.9
2002	916,964	802,730	22,294,111	4.1
2003	1,035,343	875,584	26,134,505	4.0
2004	1,033,304	842,472	27,486,371	3.8
2005	1,082,475	849,513	27,844,089	3.9
2006	1,067,454	800,658	28,050,802	3.8
2007	1,109,808	800,878	28,557,222	3.9

*Actual obligations. Source: Human Nutrition Research and Information Management (HNRIM) System. Funding reported via HNRIM are not considered official NIH numbers.

**Based on biomedical R&D price index, FY 1998 = 100 percent.

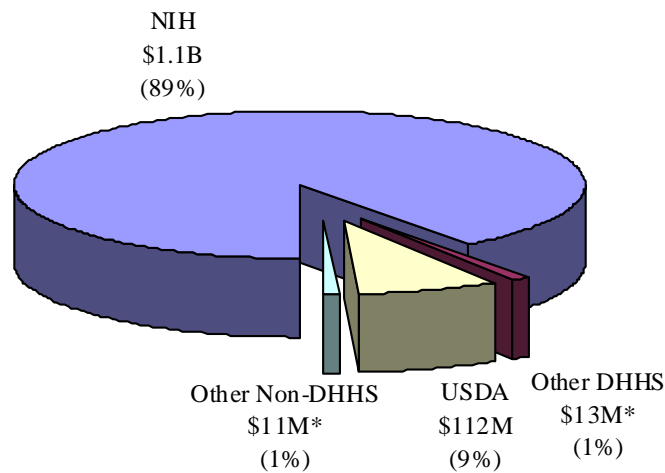
⁺Total excludes obligations for National Library of Medicine and Buildings and Facilities.

EXPENDITURES BY HNRIM SYSTEM CATEGORY AND INTEREST AREA

The NIH nutrition research support in the HNRIM system classification categories and the number of grants or contracts funded in each category are shown in Table 4. The column labeled "actual obligations" represents the *nutrition* funding for projects in each classification category, not the funding for the classification category per se. For example, a study of

the effects of smoking and diet on coronary heart disease and obesity that was considered to be 60 percent nutrition-related and had a total budget of \$100,000 would contribute \$60,000 toward the actual obligations reported for the area "Cardiovascular Disease and Nutrition" as well as \$60,000 toward the actual obligations reported for the area "Obesity, Anorexia, and Appetite Control." As this example illustrates, a grant or contract may appear in more than one category.

Figure 1. Federal Expenditures in Support of Human Nutrition Research and Training, FY 2006



Source: Human Nutrition Research and Information Management (HNRIM) System database. Funding reported via HNRIM are not considered official NIH numbers.

* Estimate

Thus, if all actual obligations in the 43 categories were summed, the sum would exceed the total nutrition expenditures for that fiscal year. The column labeled "percent of total" represents the nutrition funds expended in a given category in relation to total NIH obligations for nutrition research and training, which totaled \$1.1 billion for FY 2007.

Although NIH nutrition research encompasses all of the classification categories, the largest component is concentrated in the area of Research in the Biomedical and Behavioral Sciences (codes 1 - 25 and 35 - 37). The most frequently assigned nutrition classification codes include "Obesity, Anorexia, and Appetite Control," "Other Diseases and Nutrition," "Prevention and Nutrition," "Cancer and Nutrition," and "Cardiovascular Disease and Nutrition."

SUPPORT BY EXTRAMURAL AND INTRAMURAL CATEGORIES

The NIH supports two broad categories of research: extramural and intramural. The extramural programs are responsible for approximately 85 percent of the total NIH resources in the form of research grants or contracts. Through these programs, NIH makes awards of various kinds to institutions throughout the United States and the world. Extramural awards are based on a two-tiered peer-review assessment - one for scientific merit and one for program relevance.

Within the NIH itself, and accounting for approximately 10 percent of its budget, is the intramural program. Nearly all of the NIH institutes have an intramural component of laboratory and clinical research programs. More than 2,000 intramural research projects are in progress at all times, making the NIH the

largest center for biomedical and behavioral research in the world. Boards of scientific counselors are responsible for assessing the quality and direction of the intramural program, and the NIH Office of the Director provides scientific and policy oversight.

The NIH relies on three major funding mechanisms as the administrative instruments for accomplishing its extramural program goals: grants and cooperative agreements (financial assistance awards) and contracts (acquisition awards). Extramural nutrition research and training financial support is provided through all three of these major funding mechanisms. Support of extramural nutrition research utilizes research project grants, program project grants, center grants, contracts, and cooperative agreements.

Any of these mechanisms may include clinical trials; research resources support; reimbursement agreements; research career development awards; and new, academic, and teacher investigator awards. Extramural training in biomedical and behavioral nutrition research is supported through National Research Service Awards, with training grants awarded to institutions and fellowships awarded to individuals. The intramural nutrition program consists of research projects and training. The actual obligations in biomedical nutrition research and training by category of support for Fiscal Year 2007 are shown in Table 5.

Extramural projects comprised about 94 percent of nutrition related expenditures in Fiscal Year 2007 (\$1.01 billion). Research grants continue to comprise the largest category of support, with \$766 million and 3,195 projects. Program Projects made up the second largest category during this period, with \$86 million and 102 projects. Centers ranked third, with \$63 million and 167 projects. Contracts comprised the fourth largest category of support, with \$43 million and 107 projects. The intramural program represented 5 percent of expenditures for nutrition research and training during FY 2007, with funding of \$58 million and 198 projects.

NUTRITION RESEARCH TRAINING

The NIH supports training in biomedical and behavioral nutrition research in both the extramural and the intramural programs. Within the extramural program, two basic mechanisms are used for nutrition training support: institutional awards and individual awards. The institutional awards, commonly called “training grants,” are designed to enable institutions to make training awards to individuals selected by them for predoctoral and postdoctoral research training. In FY 2007, NIH spent \$11 million on 121 training grants in nutrition. The predoctoral and postdoctoral individual National Research Service Awards, called “fellowships,” are awarded to provide research training to individuals to broaden their scientific background and extend their potential for research. Expenditures for fellowships in nutrition were \$4.2 million for 146 fellowships in FY 2007.

RESEARCH, CONDITION, AND DISEASE CATEGORIZATION (RCDC)

At the request of Congress, the NIH embarked on a process to provide better consistency and transparency in the reporting of its funded research. This new process, implemented in FY 2008 through the RCDC system, uses sophisticated text data mining (categorizing and clustering using words and multiword phrases) in conjunction with NIH-wide definitions used to match projects to categories. The definitions are a list of terms and concepts selected by NIH scientific experts to define a research category. Due to methodology changes, it is likely that annual totals for categories in FY 2007 will exhibit a noticeable one-time adjustment. The research category funding levels represent the NIH’s best estimates based on the category definitions. This transition may affect the number of nutrition projects categorized and the corresponding total nutrition obligations. However, the subsequent coding of projects within the HNRIM system will remain unchanged.

ABOUT THE HNRIM SYSTEM

The Human Nutrition Research and Information Management (HNRIM) system is a federal government-wide, online database created for the purpose of fiscal accounting, management, and monitoring of cross-agency human nutrition research activities. The database was developed in response to a 1981 amendment to the 1977 National Agricultural Research, Extension, and Teaching Policy Act.

The system -- which operates under the auspices of the Interagency Committee on Human Nutrition Research (ICHNR) -- has been operational since 1985. It includes data on nutrition research and training expenditures from federal agencies that sponsor nutrition research. Projects are selected for inclusion in the HNRIM system by the sponsoring agency, based upon a common definition of human nutrition research agreed upon by the ICHNR. Projects are assigned nutrition classification codes compatible with the ICHNR definition of human nutrition research. The database is updated yearly by the reporting agencies through the HNRIM Program Director, a staff member in the NIH Division of Nutrition Research Coordination (DNRC).

The system was originally developed and maintained on a mainframe computer at NIH. More recently, it has been redesigned and ported to a client-server environment with a public access interface via the World Wide Web (<http://hnrnim.nih.gov>).

DEFINITION OF TERMS

Biomedical Research and Development Price Index (BRDPI): Measures real annual changes in the prices of items and services required for research and development (R&D) activities.

Constant Dollars: Dollar amounts adjusted for inflation, based on buying power in a selected base year. The BRDPI is used to determine constant dollars from current dollars.

Current Dollars: Actual dollars awarded without adjustment for inflation.

Extramural Research: Research supported by NIH through a grant, contract, or cooperative agreement.

Fiscal Year: The year beginning October 1 and ending the following September 30.

Intramural Research: Research conducted by, or in support of, employees of the NIH.

NIH Roadmap: The NIH Roadmap identifies the most compelling opportunities in three main areas: new pathways to discovery, research teams of the future, and re-engineering the clinical research enterprise.

Obligations: Data based on NIH funds that have been awarded by an NIH Institute/Center.

**Table 4. Actual Obligations, NIH Biomedical Nutrition Research and Training, by
HNRIM Classification Category, FY 2007
(in millions of dollars)**

Nutrition Research Classification	Number of Grants and Contracts	Actual Obligations	Percent of Total
01 - Maternal Nutrition	242	58	5.2
02 - Infant and Child Nutrition (0-12 years)	422	116	10.4
03 - Adolescent Nutrition (13-18 years)	225	65	5.8
04 - Adult Nutrition (19-65 years)	260	91	8.2
05 - Nutrition of the Elderly (65+ years)	223	78	7.1
06 - Cardiovascular Disease and Nutrition	892	288	26.0
07 - Cancer and Nutrition	1,116	289	26.0
08 - Other Diseases and Nutrition	1,387	346	31.2
09 - Trauma (Including Burns) and Nutrition	35	6	<1
10 - Infection--Immunology and Nutrition	247	68	6.2
11 - Obesity, Anorexia, and Appetite Control	1,545	414	37.3
12 - Genetics and Nutrition	853	230	20.7
13 - Nutrition and Function	548	170	15.3
14 - Nutrient Interactions	507	113	10.2
15 - Other Conditions and Nutrition	215	56	5.0
16 - Nutritional Status R&D	202	52	4.7
17 - Carbohydrates	351	79	7.1
18 - Lipids (Fats and Oils)	790	220	19.8
19 - Alcohols	48	15	1.3
20 - Proteins and Amino Acids	168	43	3.9
21 - Vitamins	483	136	12.3
22 - Minerals and Essential Trace Elements	343	79	7.2
23 - Water and Electrolytes	118	24	2.2
24 - Fiber	43	18	1.7
25 - Other Nutrients In Food	80	19	1.7
26 - Food Composition R&D	21	5	<1
27 - Bioavailability of Nutrients	44	11	1.0
28 - Effects of Technology on Foods and Diets	19	4	<1
29 - Other Research in Food Sciences	16	3	<1
30 - Food Consumption Survey R&D	25	4	<1
31 - Dietary Practices, Food Consumption, & Determinants	405	138	12.5
32 - Studies of Methods for Informing & Educating the Public	66	20	1.8
33 - Other Research in Nutrition Education	24	6	<1
34 - Effects of Government Policy & Socioeconomic Factors	69	23	2.1
35 - Parenteral, Enteral, and Elemental Nutrition	39	10	<1
36 - Dietary Supplements: Nutrient Ingredients	657	184	16.6
37 - Dietary Supplements: Botanical & Other Non-nutrient Ingredients	472	124	11.2
51 - Prevention and Nutrition	1,141	312	28.1
52 - International Nutrition Research	83	21	1.9
53 - Epidemiological Nutrition Research	391	109	9.8
54 - Nutrition Education for Professionals	208	37	3.4
55 - Nutrition Education for the Public	132	37	3.4
56 - Clinical Trials of Nutrients/Nutrition	482	180	16.2

* The actual obligations represent the *nutrition* funding for projects in each classification area, not the funding of the classification area per se. A grant or contract may be assigned to more than one of these areas. Thus, summing the expenditures by area will yield a value that exceeds the total expenditures and summing the percent of total will yield a value greater than 100 percent.

** The total expenditure, in thousands of dollars, of the NIH nutrition program was \$1,109,808 in FY 2007. Funding reported via HNRIM are not considered official NIH numbers.

**Table 5. Actual Obligations, NIH Biomedical Nutrition Research and Training,
by Category of Support, FY 2007
(in thousands of dollars)***

Funding Mechanism	Item	Breakdown		Total	
		Number	Cost	Number	Cost
Extramural					
Research Grants	Regular	2,818	631,258		
	Clinical Trials	377	135,040		
	Total			3,195	766,298
Program Projects	Regular	94	72,686		
	Clinical Trials	8	13,319		
	Total			102	86,005
Contracts	Regular	77	31,901		
	Clinical Trials	26	11,522		
	Total			103	43,423
Centers	Regular	159	56,877		
	Clinical Trials	8	6,236		
	Total			167	63,113
Training	Training Grants	121	11,251		
	Fellowships	146	4,220		
	Total			267	15,471
Research Resources Support				133	40,038
Career Development Awards				380	34,130
Reimbursement Agreements				23	3,055
Subtotal, Extramural				4,370	1,051,533
Intramural					
Projects				198	58,276
Training					
Subtotal, Intramural				198	58,276
Total NIH Biomedical Nutrition Research & Training				4,568	1,109,809

* Actual obligations. Source: Human Nutrition Research and Information Management (HNRIM) System database. Funding reported via HNRIM are not considered official NIH numbers.