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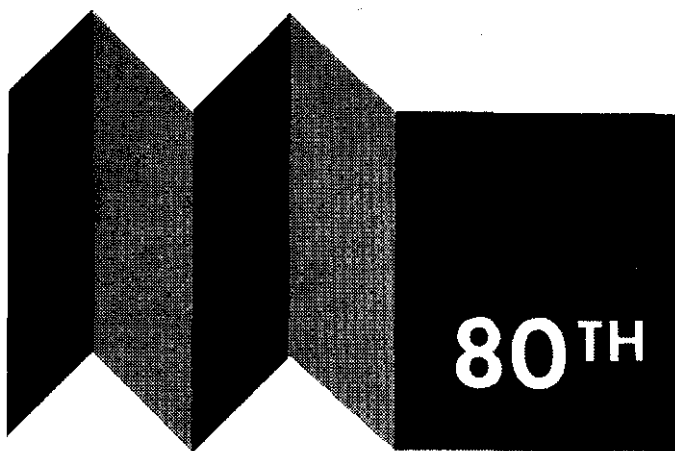


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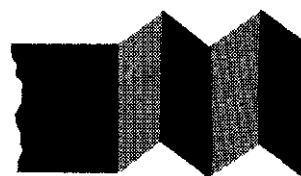


annual report

**Nebraska
Agricultural
Experiment
Station**

UNIVERSITY OF NEBRASKA
COLLEGE OF AGRICULTURE AND HOME ECONOMICS
E. F. FROLIK, DEAN H. H. KRAMER, DIRECTOR

Lincoln Nebraska



December 1966

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Issued December 1966, 2,500

Foreword

The 80th Annual Report of the Nebraska Agricultural Experiment Station contains a list of all active projects from July 1, 1965 to June 30, 1966, a list of Station publications, staff members, and a financial report. Information derived from the various research projects is published in bulletins, circulars, scientific and trade journals, in the *Nebraska Experiment Station Quarterly* and as mimeographed departmental reports. Station bulletins, circulars and the *Quarterly* may be obtained free from county agricultural agents or by writing to the Director of the Experiment Station, University of Nebraska College of Agriculture and Home Economics, Lincoln, Nebraska, 68503. Reprints of most journal articles may be obtained by writing directly to the authors.

HERBERT H. KRAMER
Director

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 M. A. Alexander,^{1,2,3} M.Sc., Professor, Sheep
 V. H. Arthaud,^{1,2} M.Sc., Assistant Professor, Meats and Breeding
 M. L. Baker,^{1,2} M.Sc., D.Sc., Professor, Beef Nutrition (Emeritus)
 C. T. Blunn,^{1,2} Ph.D., Professor, Genetics
 T. H. Doane,^{1,2,3} Ph.D., Associate Professor, Sheep
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L. E. Lucas,^{2,3} Ph.D., Associate Professor, Swine Breeding
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 E. R. Peo, Jr.,^{1,2} Ph.D., Associate Professor, Swine Nutrition
 P. E. Vipperman,^{1,2} Ph.D., Assistant Professor, Swine Nutrition
 W. R. Woods,^{1,2} Ph.D., Professor, Beef Nutrition
 D. R. Zimmerman,^{1,2} Ph.D., Professor, Reproduction Physiology

Biochemistry and Nutrition

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 J. M. Daly,^{1,2} Ph.D., Professor, Intermediary Metabolism
 Richard Dam,^{1,2} Ph.D., Assistant Professor, Nutritional Biochemistry
 R. M. Hill,^{1,2} Ph.D., Associate Professor, Protein Biochemistry
 H. W. Knoche,^{1,2} Ph.D., Assistant Professor, Biochemical Endocrinology
 D. R. Lineback,² Ph.D., Assistant Professor, Enzymes
 R. L. Ogden,² B.Sc., Assistant Professor, Alfalfa Processing
 Mrs. Patricia P. Weymouth,² Ph.D., Research Analysis, Nucleic Acid Biochemistry

Dairy Science

P. L. Kelly,^{1,2,3} Ph.D., Professor and Chairman of Department
 R. C. Chandan,² Ph.D., Research Associate, Dairy Chemistry
 P. H. Cole,^{1,2,3} M.Sc., Associate Professor, Extension Dairyman
 L. K. Crowe,^{1,2} Ph.D., Professor, Dairy Technology
 C. W. Dill,^{1,2} Ph.D., Associate Professor, Dairy Technology
 T. A. Evans,^{1,2,3} M.Sc., Associate Professor, Dairy Marketing
 R. B. Maxcy,^{1,2} Ph.D., Professor, Microbiology
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 J. R. Vakil,^{1,2} Ph.D., Research Associate
 L. J. Valke,^{1,2} B.Sc., Instructor, Dairy
 K. M. Nilson,^{1,2} M.Sc., Instructor, Dairy

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H. W. Ottoson,^{1,2,3} Ph.D., Professor and Chairman of Department
 L. L. Bitney,^{2,3} B.Sc., Assistant Professor, Farm Management
 H. W. Delvo,^{2,5} M.Sc., Instructor, Farm Management
 Alfred Eckert,² M.A., Assistant Professor, Marketing
 A. W. Epp,^{1,2} Ph.D., Professor, Farm Management
 Loyd Fischer,^{1,2} Ph.D., Professor, Land Economics
 J. D. Greer,^{1,2,3} B.Sc., Assistant Professor, Farm Management
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 P. A. Henderson,^{2,3} Ph.D., Professor, Farm Management
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 C. J. Miller,^{1,2} Ph.D., Associate Professor, Marketing
 John Muehlbeier,^{2,5} M.Sc., Professor, Land Economics

Glen Vollmar,^{1,2} Ph.D., Associate Professor, Farm Management and Production
Economics
Richard Walsh,^{1,2} Ph.D., Associate Professor, Marketing
Clayton Yeutter,^{1,2,3} Ph.D., Assistant Professor, Land Economics

Editorial

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G. I. Johnson,^{2,3} B.A., Assistant Professor, Press
Marilyn Lunner,^{2,3} B.Sc., Instructor, Home Economics Radio and Television
Dwain Trenkle,^{1,2,3} B.Sc., Assistant Professor, Radio and Television

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M. G. McCreight,^{1,2} M.Sc., Associate Professor, Agricultural Education

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A. R. Dedrick,^{2,5} M.Sc., Instructor, Soil and Water Conservation
J. A. DeShazer,^{1,2} Ph.D., Associate Professor, Livestock Facilities
D. M. Edwards,^{1,2} Ph.D., Associate Professor, Natural Resources
L. F. Larsen,² M.Sc., Professor, Tractor Testing
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S. O. Nelson,^{2,5} M.Sc., Associate Professor, Production Processing
G. M. Petersen,² M.Sc., Associate Professor, Farm Structures
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H. D. Wittmuss,^{1,2} Ph.D., Associate Professor, Natural Resources
F. M. Zoz,² M.Sc., Assistant Professor, Tractor Testing

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R. E. Hill,^{1,2,3} Ph.D., Professor and Chairman of Department
W. T. Atyeo,^{1,2} Ph.D., Associate Professor, Insect Systematics and Acarology
H. J. Ball,^{1,2} Ph.D., Professor, Insect Physiology and Toxicology
J. H. Bell,^{2,5} B.Sc., Research Associate, Grasshopper Control
C. M. Jones,^{2,5} M.Sc., Instructor, Livestock Pests
S. D. Kindler,^{2,5} B.Sc., Instructor, Forage Crops Insects
D. E. Lawson,² M.Sc., Instructor, Insect Physiology
G. R. Manglitz,^{2,5} Ph.D., Associate Professor, Forage Insect Investigations
J. D. Munson,² M.Sc., Instructor, Corn Insects
K. P. Pruess,^{1,2} Ph.D., Associate Professor, Economic Entomology

J. M. Schalk,^{2,5} M.Sc., Instructor, Forage Crop Insects
Robert Staples,^{1,2} Ph.D., Associate Professor, Insect and Plant Disease Relationships

Horticulture and Forestry

J. O. Young,^{1,2,3} Ph.D., Professor and Chairman of Department
W. T. Bagley,^{1,2} M.Sc., Associate Professor, Forestry
D. P. Coyne,^{1,2} Ph.D., Associate Professor, Horticulture
A. E. Dudeck,² Ph.D., Assistant Professor, Turf
E. J. Kinbacher,² Ph.D., Associate Professor, Physiology
G. G. Long,^{1,2} M.Sc., Instructor, Horticulture
R. E. Neild,² M.Sc., Assistant Professor, Horticulture
D. S. Nuland,² M.Sc., Instructor, Horticulture
R. B. O'Keefe,^{1,2} Ph.D., Associate Professor, Horticulture
H. M. Pellett,² Ph.D., Assistant Professor, Ornamentals
R. A. Read,^{2,5} M.F., Research Associate, Forestry
N. J. Rosenberg,^{1,2} Ph.D., Associate Professor, Physiology
C. Y. Sullivan,² Ph.D., Assistant Professor, Physiology
D. F. Van Haverbeke,^{2,5} M.Sc., Instructor, Forestry

Plant Pathology

M. G. Boosalis,^{1,2,3} Ph.D., Professor and Chairman of Department
W. B. Allington,^{1,2} Ph.D., Professor, Virus Diseases
M. K. Brakke,^{2,3} Ph.D., Professor, Virus Diseases
R. W. Goss,² Ph.D., Professor, Fungus Diseases (Emeritus)
D. S. Meredith,² Ph.D., Associate Professor, Epidemiology
Glenn Peterson,^{2,3} Ph.D., Assistant Professor, Tree Diseases
M. L. Schuster,² Ph.D., Professor, Nematode Diseases
J. L. Van Etten,^{1,2} Ph.D., Assistant Professor, Plant Physiology

Poultry Science

T. E. Hartung,^{1,2,3} Ph.D., Professor and Chairman of Department
D. H. Free,^{1,2} B.Sc., Instructor, Poultry Improvement
G. W. Froning,^{1,2,3} Ph.D., Associate Professor, Poultry Production
E. W. Gleaves,^{2,3} Ph.D., Assistant Professor, Poultry Nutrition
T. W. Sullivan,^{1,2,3} Ph.D., Professor, Poultry Nutrition
H. L. Wieggers,^{1,2,3} M.Sc., Assistant Professor, Poultry and Wildlife Management

Veterinary Science

M. J. Twiehaus,^{1,2,3} M.Sc., D.V.M., Professor and Chairman of Department
J. M. Aiken,² M.Sc., D.V.M., Research Associate, Swine Diseases
R. E. Coupe,² B.Sc., Instructor, SPF Swine
J. W. Dunn,² M.S., D.V.M., Research Associate, Cattle Diseases
D. L. Ferguson,^{1,2} M.Sc., Instructor, Parasitology
O. D. Grace,^{1,2} M.Sc., D.V.M., Professor, Diagnostic Laboratory
C. L. Marsh,² Ph.D., Associate Professor, Biochemistry
C. A. Mebus,^{1,2} D.V.M., Ph.D., Professor, Pathology
K. C. Olson,² B.Sc., Instructor, SPF Swine
L. C. Payne,^{1,2} D.V.M., Ph.D., Professor, Physiology
M. B. Rhodes,² M.Sc., Instructor, Enzymology of Parasites

R. L. Sweat,^{1,2} B.Sc., D.V.M., Instructor, Cattle Diseases
N. R. Underdahl,² B.A., M.S., Associate Professor, Swine Diseases
A. B. Welch,² B.Sc., Instructor, Viral Diseases Swine
L. C. Welch,² B.Sc., Instructor, SPF Field Coordinator

Library

W. R. Collings,^{1,2} B.Sc., BLS, Senior Librarian

Statistics

R. F. Mumm,² M.Sc., Instructor, Statistical Consultant

School of Home Economics

Family Economics and Management

Dorothy Larery,^{1,2,3} Ph.D., Professor and Chairman of Department
A. E. Baragar,^{1,2} M.Sc., Associate Professor, Housing and Equipment
Florence Walker,^{1,2} Ph.D., Associate Professor, Family Economics and Management

Food and Nutrition

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Constance Kies,^{1,2} Ph.D., Associate Professor, Food and Nutrition
Marie Knickrehm,^{1,2} Ph.D., Professor, Institutional Administration
Pauline Paul,^{1,2} Ph.D., Professor, Food and Nutrition

Home Economics Education

Hazel Anthony,^{1,2} Ph.D., Professor and Chairman of Department
Shirley Kreutz,^{1,2} Ph.D., Associate Professor, Home Economics Education

Human Development and the Family

J. C. Woodward,^{1,2,3} Ph.D., Professor and Chairman of Department
J. N. Edwards,^{1,2} Ph.D., Associate Professor, Family Relations
Mrs. Ruby Gingles,^{1,2} M.Sc., Associate Professor, Family Relations

Textiles, Clothing and Design

Audrey Newton,^{1,2,3} M.Sc., Associate Professor and Chairman of Department
June Ericson,^{1,2} M.A., Assistant Professor

Regional Stations

Box Butte Experiment Station, Alliance, Nebraska

Paul Ehlers,² B.Sc., Superintendent of Station

Fort Robinson Beef Cattle Research Station, Crawford, Nebraska

J. E. Ingalls,^{2,5} M.Sc., Superintendent of Station
L. D. Baumann,² B.Sc., Technician, Animal Science
S. C. Eittreium,^{2,5} D.V.M., Research Associate
D. L. Hall,² B.Sc., Technician, Animal Science
C. W. Kasson,² M.Sc., Technician, Animal Science
J. A. Rothlisberger,² M.Sc., Assistant Superintendent

Northeast Station, Concord, Nebraska

H. J. Zimmerman,^{2,3} M.Sc., Assistant Agriculturalist and Acting Area Supervisor
U. U. Alexander,^{2,3} M.Sc., Assistant Professor, Agronomy
R. D. Fritschen,^{2,3} M.Sc., Assistant Professor, Agronomy
D. J. Kubik,^{2,3} B.Sc., Associate Extension Agriculturalist, Dairy
E. J. Schwartz,^{2,3} B.Sc., Assistant Professor, Agronomy
W. L. Tolman,² B.Sc., Assistant Professor, Animal Science

Scotts Bluff Experiment Station, Mitchell, Nebraska

Lionel Harris,^{2,3} M.Sc., Superintendent of Station
F. N. Anderson,² M.Sc., Instructor, Agronomy
L. A. Daigger,^{2,3} M.Sc., Associate Professor, Area Specialist, Soils
C. R. Fenster,^{2,3} B.Sc., Associate Professor, Crop Management
A. F. Hagen,² M.Sc., Assistant Professor, Entomology
W. F. Peterson,^{2,5} M.Sc., Research Associate, Agronomy

University of Nebraska Field Laboratory, Mead, Nebraska

F. C. Hastert,² B.Sc., Operations Manager
W. W. Sahs,² M.Sc., Superintendent of Field Laboratory

North Platte Experiment Station, North Platte, Nebraska

L. F. Sheffield,^{2,3} M.Sc., Superintendent of Station
M. G. Rumery,² B.Sc., Associate Professor and Assistant Superintendent
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D. M. Danielson,² Ph.D., Assistant Professor, Animal Science
P. H. Grabowski,² B.Sc., Assistant Professor, Agronomy, Outstate Testing
P. T. Nordquist,² M.Sc., Instructor, Agronomy
D. E. Smika,^{2,5} M.Sc., Research Soil Science
John Vallentine,^{2,3} Ph.D., Associate Professor, Range Management
Glenn Viehmeyer,² Assistant Professor, Horticulture
G. A. Wicks,² M.Sc., Assistant Professor, Weed Control

¹ College Staff

² Station Staff

³ Extension Staff

⁴ Leave of Absence

⁵ Cooperative, USDA

*Includes only staff holding Experiment Station appointment on July 1, 1966.

Nebraska Agricultural Experiment Station Research Projects

Research projects are listed in order by subject matter departments. An asterisk (*) indicates that the project was discontinued in fiscal 1965-1966.

Administration

- 1-1 General administration of federal grant funds research. E. F. Frolik and H. H. Kramer.
- 1-2 The planning and coordination of cooperative regional research. H. H. Kramer.
- 1-3 Administration of federal grant marketing research funds. H. H. Kramer.

Agricultural Economics

- 10-1 Farm business and enterprise analysis. A. W. Epp.
- 10-12 An economic analysis of the farm real estate market in Nebraska. H. W. Ottoson, L. K. Fischer and Rodney Johnson.
- 10-17 Use of ground water in excess of recharge-economic consequences and possible methods of control. L. K. Fischer.
- *10-20 The determination of optional hog marketing rates with respect to weight classes and time. J. B. Hassler.
- *10-22 Transportation services and costs for agricultural products from the Northern Plains States. C. J. Miller.
- *10-25 An evaluation of easements as a land use adjustment and production control device. Milton Griffing, H. W. Ottoson, L. K. Fischer and John Muehlbeier.
- *10-27 Changes in the market structure and competitive practices of the wheat milling industry and implications for alternative methods of farmer organization for bargaining in the Great Plains. R. G. Walsh.
- *10-29 Adjustments in livestock marketing in the North Central States to changing patterns of production and consumption. J. B. Hassler.
- *10-30 Volume cost relationships in farm supply cooperatives. R. G. Walsh.
- 10-32 Needed adjustments in land tenure to meet changing agricultural conditions. L. K. Fischer.
- *10-33 The impact of changing conditions on Nebraska grain marketing. C. J. Miller.
- 10-34 Economics of beef production in range area of Nebraska. A. W. Epp.
- 10-36 Present status and potential development of cattle feeding on Northeast Nebraska farms. A. Eckert and R. D. Johnson.
- 10-37 Taxes paid for the support of selected state and local services and a comparison of these taxes with income and with the quality of services in the Great Plains states. E. B. Schmidt.
- *10-38 An appraisal of the crop insurance program in Nebraska. H. W. Ottoson and R. H. Cole.
- 10-39 Supply response and production adjustments for hog and beef cattle production in Nebraska. A. W. Epp and M. D. Skold.
- 10-40 Implications of the European common market for midwestern agriculture. J. G. Kendrick.

- 10-41 Effects of technological changes on inter-area competition for the livestock-feed-wheat sectors of the midwest. J. B. Hassler and H. W. Ottoson.
- 10-43 Adjustment opportunities for wheat farms. M. D. Skold and H. W. Ottoson.
- 10-44 An economic evaluation of new technological developments in the swine industry and alternative systems of producing swine in Nebraska. P. A. Henderson.
- 10-45 Economic factors affecting sugar marketing. C. J. Miller.
- 10-46 Dairy market adjustment problems in the North Central region. T. A. Evans.
- 10-47 Long run adjustments in livestock market organization in the North Central region. J. C. Kendrick and J. B. Hassler.
- 10-48 Economic growth of Nebraska farm and ranch firms. G. T. Vollmar.

Agricultural Engineering

- 11-1 Evaluation of belt and drawbar performance characteristics of new tractors. L. F. Larsen.
- 11-2 Use of radio-frequency energy for insect control and conditioning of farm products. S. O. Nelson, L. E. Stetson, J. J. Rhine and H. J. Ball.
- 11-3 Planning farmstead buildings and their auxiliary equipment. O. E. Cross.
- 11-7 The integration of machine operations required in crop culture. B. R. Somerhalder.
- 11-8 Engineering phases of land treatment related to soil storage and use-efficiency of rainfall. H. D. Wittmuss.
- *11-9 Factors affecting the drying rate and the compaction characteristics of alfalfa hay. K. L. Von Bargaen.
- *11-10 Automatic control of agricultural tractors. J. D. Pichon and G. W. Steinbruegge.
- *11-11 Water loss by evaporation from soil and plant surface. J. R. Davis.
- 11-12 Engineering and agronomic studies associated with land shaping under dryland conditions in western Nebraska. P. L. Ehlers and H. D. Wittmuss.
- *11-13 Water infiltration rate determinations on Holdrege, Keith and Sharpsburg soils. H. D. Wittmuss and A. P. Mazurak.
- *11-14 The relationship of moisture, density and temperature to the appearance and chemical composition of baled alfalfa hay. L. F. Nelson.
- 11-16 The mechanics and measurement of soil tillage. G. W. Steinbruegge.
- *11-17 Energy production potential on irrigated land. B. R. Somerhalder.
- 11-18 Effect of dynamic loading on tractor performance. J. J. Sulek.
- 11-20 Thermogenic properties and nutrient retention of grain at different moisture levels during storage. O. E. Cross.
- 11-21 Operations research on mechanized systems for cutting, curing and handling hay. R. W. Kleis and G. M. Petersen.
- 11-22 Development of materials handling systems for North Central farms. L. F. Nelson.

Agronomy

- 12-1 Determination and application of principles of corn improvement. J. H. Lonnquist and N. E. Williams.
- 12-2 Improvement and evaluation of oats and barley. D. D. Warnes.

- 12-5 Developing and applying principles of alfalfa improvement. W. R. Kehr.
- 12-6 Cultural, ecological and physiological studies with various agronomic crops. W. L. Colville.
- 12-7 Chemical and cultural control of weeds. O. C. Burnside, G. A. Wicks and C. R. Fenster.
- 12-8 Improvement of forage grasses by breeding and the propagation and evaluation of new strains and experimental varieties of grasses. L. C. Newell.
- 12-9 A study of the adaptation, improvement and culture of grain and forage sorghums. P. T. Nordquist and P. L. Ehlers.
- *12-10 Crop residues. T. M. McCalla, W. D. Guenzi, F. A. Norstadt and H. E. Weakly.
- 12-11 Mineralogical, physical and chemical characterization of Nebraska soils in relation to their genesis, classification and mapping. J. V. Drew.
- 12-12 Selection, breeding and testing of soybeans for productivity, high oil and protein content for industrial and farm utilization. J. H. Williams.
- 12-13 Microbiological studies of stubble mulching in the Great Plains. T. M. McCalla and W. D. Guenzi.
- 12-17 Use of fertilizers for legume production and maintenance of soil productivity in Nebraska. R. A. Olson, U. U. Alexander and E. J. Penas.
- *12-18 Preservation of alfalfa clones and seed stocks needed in alfalfa improvement and preliminary evaluation of plant introductions. W. R. Kehr.
- *12-19 The introduction, multiplication, preservation and determination of potential value of new accessions and strains of native and exotic grasses. L. C. Newell.
- *12-21 Corn germplasm preservation. J. H. Lonnquist.
- *12-22 Improvement of soil management practices with the aid of radioactive isotopes. R. A. Olson, D. D. Stukenholtz and K. D. Frank.
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Wilson, Ben B., J1903a
Wiltbank, J. N., RB224, J1786, J1824
Wood, W. W., J1666, J1902a, J1903a
Woodruff, N. P., J1926
Yeutter, Clayton, SB491, J1919
Young, J. O., SB488, J1650, J1910
Zimmerman, D. R., J1824

The University of Nebraska
Agricultural Experiment Stations
REPORT OF INCOME AND EXPENDITURES
For the Year Ended June 30, 1966

GENERAL CURRENT FUNDS

Funds Available:

Received from United States Government	
Hatch Fund	\$ 608,790.00
Budgeted by the University	1,748,829.49
Total	\$2,357,619.49

Expenditures:

Salaries and Wages	\$1,873,297.19
Operating Expense	328,161.11
Equipment and Improvements	156,161.19
Total	\$2,357,619.49

RESTRICTED CURRENT FUNDS

Income:

Gifts, Grants, and Contracts	
From United States Government Agencies	\$ 863,663.23
From State of Nebraska Agencies	139,717.22
From Industry	201,626.24
From Foundations and Health Organizations	69,668.59
From Other Sources	1,523.95
Total	\$1,276,199.23

Expenditures:

Salaries and Wages	\$ 822,005.57
Operating Expenses	332,149.13
Equipment and Improvements	122,044.53
Total	\$1,276,199.23

CASH AUXILIARY FUND

Income:

Sales and Services	\$1,839,277.31
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Expenditures:

Salaries and Wages	\$ 403,147.43
Operating Expenses	1,332,217.00
Equipment and Improvements	103,912.88
Total	\$1,839,277.31