

**FACULTY OF AGRICULTURAL
AND FOOD SCIENCES**



**ANNUAL REPORT OF RESEARCH ACTIVITIES
AND COMMUNITY SERVICES**

October 1, 2006 – September 30, 2007

PREPARED BY

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Executive Summary

Over the last six years, FAFS was actively engaged in research and community services and was able to attract over 25 million dollars from international and local donors to sponsor these activities. Roughly 95% of funds were donated by international agencies. In 2006-2007, the number of service contracts reached 12 with a total funding of over USD 950,000. The number of internationally funded grants was 10 with total funds exceeding USD681, 000; while the number of locally funded grants was 19 with a total budget of about USD 101,000. The total number of publications in refereed international journals during this year was 31 articles, in addition to one book, 11 chapters in books/manuals and 37 abstracts. During this academic year 31 theses were completed.

Introduction

During the last six years, FAFS was able to attract about USD 16.4 million to sponsor its research activities and USD 8.68 million to manage and implement community development projects (Table 1); thus the total funds for research and services reached about USD 25 million. International research funding amounted to USD 15.5 million while local research funding, mainly from University Research Board (URB) and Lebanese National Council for Scientific Research (LNCSR), reached USD 0.915 million and represented about 5.5 % of total funds (Table 1 and Figure 1). Since 2001, external funding increased to reach a peak in 2005-2006 and declined in 2006-2007 (see Figure 2). During this period over 188 articles were published in international journals in addition to 135 abstracts or papers in proceedings of regional and international meetings, as well as nine books and 38 chapters in books/manuals (see Table 2).

Table 1. Total funding for the Faculty of Agricultural and Food Sciences for the academic period 2001 – 2007

Service Contracts	Research		
	Regional and International Funds	URB and other AUB funded research	LNCSR
\$8,683,146.00	\$15,474,193.00	\$658,750.00	\$247,666.00

Table 2. Publications of the Faculty of Agricultural and Food Sciences for the academic period 2001 – 2007

Refereed articles	Books	Proceedings and Abstracts	Reports	Chapters in books
188	9	135	73	38

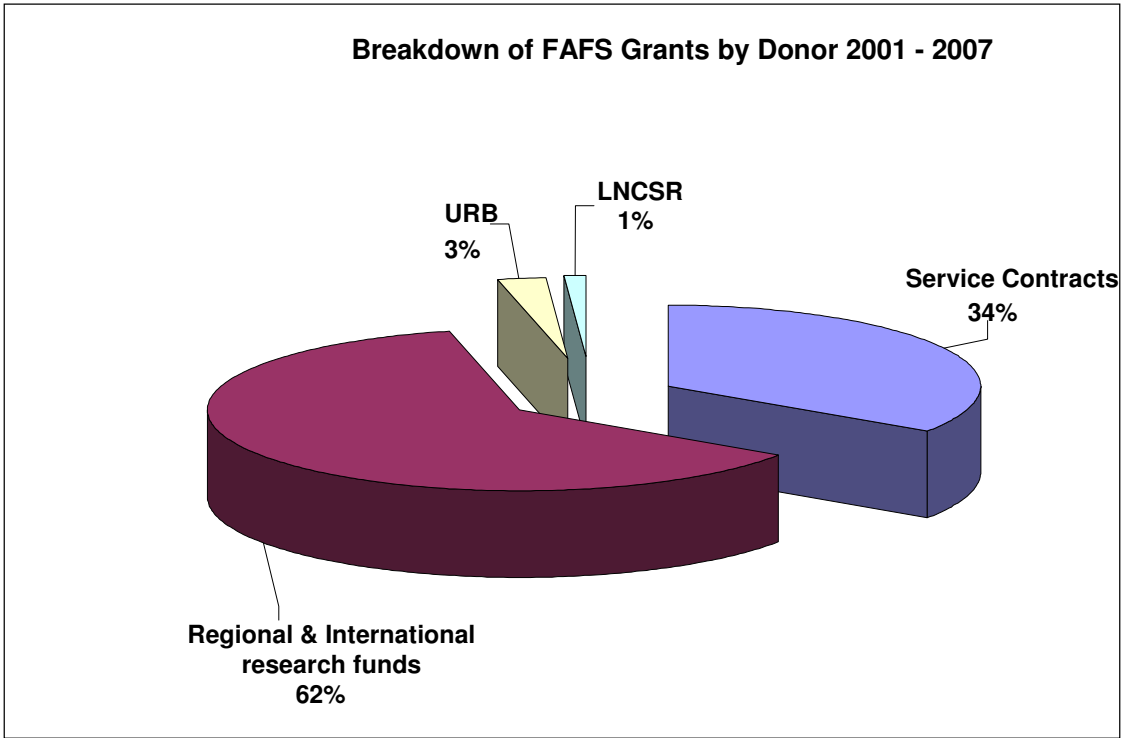


Figure 1. FAFS grants 2001 - 2007 by source

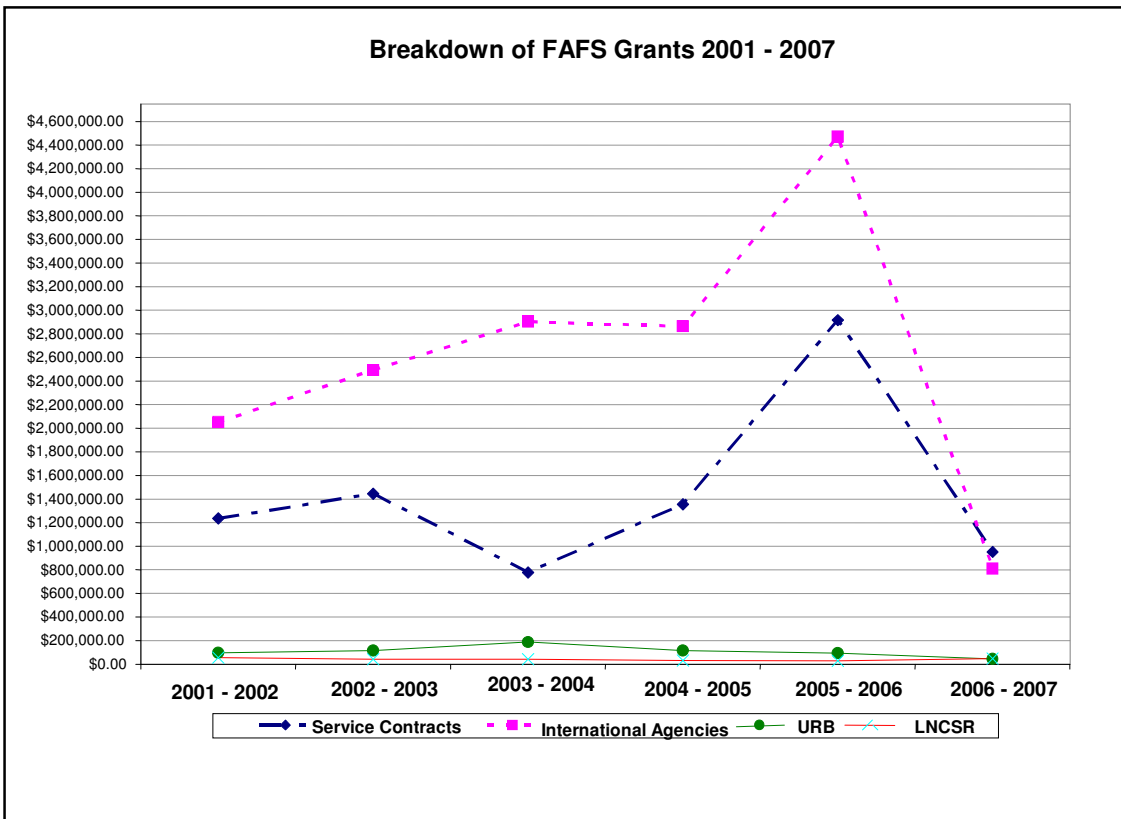


Figure 2. Breakdown of FAFS grants by source and academic year

Research activities and community services (2006-7)

During the academic year 2006-2007, FAFS was engaged in sponsored research and community development activities with a budget amounting to USD 1.74 million (Table 3). International agencies were the major source of support for these activities, while university funding (URB) constituted only about 3% of total sponsored activities (see Figure 3)

Table 3. Total funding for the Faculty of Agricultural and Food Sciences for the academic year 2006 – 2007

Service Contracts	Research		
	Regional and International Funds	URB and other AUB funded research	LNCSR
\$952,196.00	\$681,975.00	\$51,722.00	\$49,306.00

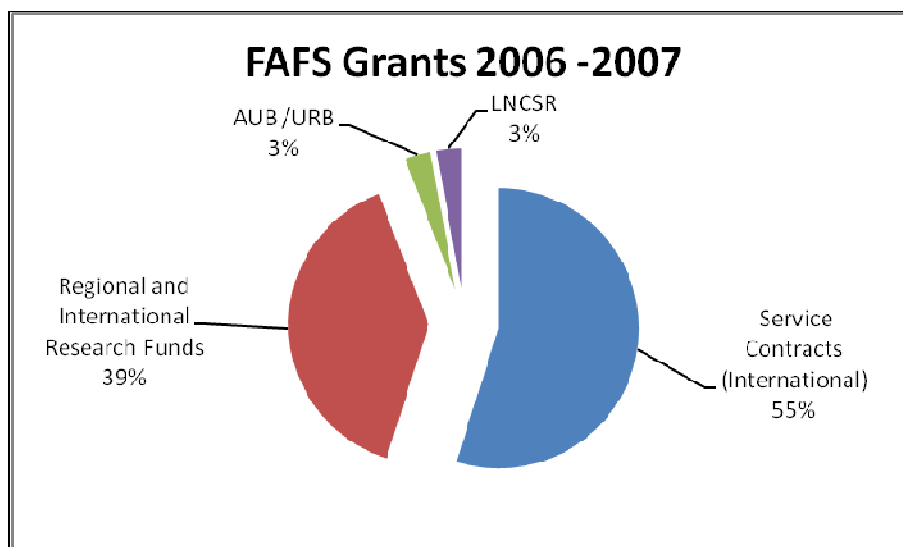


Figure 3. Grants distribution according to donor type 2006 - 2007

Overall 42 research grants and service contracts were operational in 2006-2007; they may be subdivided into 12 service contracts, 10 internationally supported research grants and 18 locally supported grants by LNCSR and URB. As shown in Table 4, the LWRS department attracted the largest share of service contracts (\$867,196); while all departments were active in research with the Plant Sciences department attracting the largest research funds from international agencies (\$489,000). The service grants obtained by Affiliated Programs and Centers summed up to over \$520,000 (see Table 5).

Table 4. FAFS Grants by department and donor 2006 – 2007

	Animal Sciences	Land and Water Resources	Nutrition and Food Sciences	Plant Sciences
Service Contracts	\$85,000.00	\$867,196.00		
Regional and International Research Funds	\$30,775		\$162,200.00	\$489,000.00
URB and other AUB Funded Research	\$15,345.00		\$22,609.00	\$13,768.00
LNCSR	\$19,954.00		\$10,667.00	\$18,685.00

Table 5. Grants to FAFS affiliated programs and centers 2006 – 2007

	Environment and Sustainable Development Unit (ESDU)	Nature Conservation Center for Sustainable Futures (IBSAR)	Graduate Environmental Sciences Program Graduate Environmental Sciences Program (IGESP)
Service Contracts	\$85,000.00	\$15,532.00	\$419,731.00

FAFS was also active in partnering with local and international organizations to engage in community development sponsored projects. The service contracts covered five areas: community development, biodiversity, environment, sustainable development and urban agriculture. The donors were: the Food and Agriculture Organization (FAO); the International Development Research Centre (IDRC), Canada; Social and Economic Action for Lebanon (SEAL), USA; Unità e Cooperazione per lo Sviluppo dei Popoli (UCODEP), Italy; Heinrich Boell Foundation, Germany; Resource Centers on Urban Agriculture and Food security (RUAF) Foundation, Netherlands; and the United Nations Environment Program (UNEP).

Out of 29 research grants, 10 were sponsored mainly by regional and international agencies including: Mercordi Company, Belgium; Dr. Rath Research Institute, Santa Clara, Ca., USA; Green Peace Research Laboratories USA; AUB Initiative for Biodiversity Studies in Arid Regions (IBSAR); International Atomic Energy Agency (IAEA); International Development Research Centre (IDRC); United States Agency for International Development (USAID); United Nations Industrial Development Organization (UNIDO) / Ministry of Environment; and the private sector. The remaining research grants were supported by URB (9 grants), AUB Task Force for Reconstruction and Community Service (1 grant) and LNCSR (9 grants).

A detailed listing of service contracts and international, regional and local research grants is included in Appendix 1.

FAFS Faculty members published 31 articles in international refereed journals, one book and 11 chapters in books/manuals published by international press (Table 6). In addition, faculty members produced 16 technical and consultancy reports and their contribution to international and regional meetings and forums was recognized through 37 published abstracts or papers in proceedings (Table 6). All four departments contributed to this research output (Table 7). A tendency towards more interdepartmental collaborative research was observed during the last few years.

Table 6. Publications of the Faculty of Agricultural and Food Sciences for the academic year 2006 – 2007

Refereed articles	Books	Proceedings and Abstracts	Reports	Chapters in books or Manuals
31	1	37	16	11

Table 7. FAFS publications by department 2006 – 2007*

	Animal Sciences	Land and Water Resources	Nutrition and Food Sciences	Plant Sciences
Refereed articles	12	5	11	14
Books	1	1		1
Proceedings and abstracts	5	20	8	10
Reports		15	1	
Chapters in books or in Manuals		7	2	2

* including publications shared between departments.

Appendix 2 includes a listing, by department, of all publications and theses produced by FAFS faculty members.

Appendix 1

Detailed Service Contracts and International, Regional and Local Research Grants

Table 8. Service Contracts to FAFS for the academic year 2006-2007

Research Area	Title	Department	Coordinator	Funding Agency	Period of Grant	Amount in USD as of Oct 1, 06	Total Approved Budget USD
Community Development	1. Communication for Development: Regional Capacity Building	ESDU	S.K. Hamadeh	FAO	2006-2007		35,000
Community Development	2. Communication for Development: Regional Portal	ESDU	S.K. Hamadeh	FAO	2006-2007		10,000
Community Development	3. Outcome Mapping: Regional Capacity Building	ESDU	S.K. Hamadeh	IDRC	2006-2007		40,000
Biodiversity	Study for the Inventory of Typical Lebanese Products	IBSAR	R. Zurayk	UCODEP	July 1, 2007-September 10, 2007	15,532	15,532
Biodiversity	Biodiversity Conservation through Use: Laurel Soap to Enhance Women's Livelihoods in Aita al Shaab	IGESP	R. Zurayk	SEAL-USA	2006-Open	15,000	15,000
Environment	Understanding Water, Understanding Health: The Case of Bebnine.	IGESP	I. Nuwayhid Co-PI: R. Zurayk	IDRC	Dec. 27, 04-March. 31, 07	340,981.02	340,981.02
Sustainable development	Mobile Rural Community Development Centre	IGESP	R. Zurayk	USA and Heinrich Boell Foundation, Germany	2006-2007	45,000	45,000
Sustainable development	Rehabilitation of the multifunctional centres of Aytaroun as instrument to promote economic recovery and strengthen the local community.	IGESP	R. Zurayk	UCODEP	August 2007-March 15, 2008	13,750	13,750
Environment	GEO 4 Launch	IGESP	R. Zurayk	UNEP	Oct-Dec., 2007	5,000	5,000

“Table 8 – Continued”

Research Area	Title	Department	Coordinator	Funding Agency	Period of Grant	Amount in USD as of Oct 1, 06	Total Approved Budget USD
Environment	Global Environment Outlook 4 (GEO-4)	LWRS	R. Zurayk	UNEP	Aug 30, 05- Aug 31, 07	\$10,000	\$10,000
Urban Agriculture	Regional Training and Knowledge Sharing in Urban Agriculture for the Middle East and North Africa	LWRS	R. Zurayk	Cities Feeding People Initiative of the International Development Research Center	2005-2007	384,995	384,995
Urban Agriculture	Cities Farming for the Future	LWRS	R. Zurayk	RUAF Foundation	March 1, 2006- Dec. 30, 2006	36,937.60	36,937.60
Total							\$952,195.62

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Table 9. Funded Research: Regional and International Agencies

Research Area	Title	Dept.	Investigator (PI)	Funding Agency	Period of Grant	Amount in \$/€ as of Oct. 1, 06	Total Approved Budget \$/€
Animal Diseases	Evaluation of Colinex LA as an immune modulator against E. coli infection in poultry	ANSC	E. Barbour	Mercordi Company, Belgium	Oct. 1, 2006- Jan. 30, 2007	\$6,000.-	\$6,000
Animal Diseases	Evaluation of the ingredients of Epican Forte on Avian Influenza Flu	ANSC	E. Barbour	Dr. Rath Research Institute, Santa Clara, Ca., USA	Jan. 1, 07- Dec. 31, 07	\$6,325.-	\$6,325
Diseases	The effect of essential oils against Candida albicans	ANSC	E. Barbour	HiTech FZE private sector funding to IBSAR	Oct. 1, 06- Sept. 30, 07	\$7,000.-	\$7,000
Diseases	The effect of essential oils against Propioni acne	ANSC	E. Barbour	HiTech FZE private sector funding to IBSAR	Oct. 1, 06- Sept. 30, 07	\$5,000.-	\$5,000
Environment	Dynamics of PAH and PCB in oysters of the Eastern Mediterranean	ANSC	E. Barbour	Green Peace Research Laboratories USA	May 9, 07-June 30, 07	6,450 €	6,450 €
Clinical Nutrition	Body fat and its relationship with metabolic syndrome indicators in overweight (BMI \geq 85th percentile) pre-adolescent children and adolescents in Lebanon.	NFSC	N. Hwalla	IAEA	Dec 14 2007-2008	7,200 €	7,200 €
Multi-disciplinary	Wild Edible Plants: Promoting Dietary Diversity in Poor Communities of Lebanon	NFSC	M. Batal	IDRC	2005-2007		\$155,000

“Table 9 – Continued”

Research Area	Title	Dept.	Investigator (PI)	Funding Agency	Period of Grant	Amount in \$/€ as of Oct. 1, 06	Total Approved Budget \$/€
Integrated Pest Management	Development of tomatoes with combined resistance to <i>Tomato yellow leaf curl virus (TYLCV)</i> using both virus-derived resistance and molecular marker assisted breeding	PLSC	Y. Abou-Jawdah	USAID	2004-2009	153,000	\$269,000
Integrated pest management	Lebanon Methyl Bromide Alternatives Project for the Strawberry Sector UNIDO Project No.: MP/LEB/01/184	PLSC	A. Saad	UNIDO/ MoE	4 months	\$ 2,400	??
Multi-disciplinary	A Holistic Landscape Approach to Biodiversity Use in Lebanon	PLSC	S. Talhouk	Private sector funding to IBSAR	2005-2007		\$220,000
Total US \$							\$668,325
Total EURO							13,650 €

Table 10. Funded Research: University Research Board (URB) and other AUB Funded Research

Research Area	Title	Dept.	Investigator (PI)	Budget USD
Weed Science	Fertigation with Phosphoric Acid (H ₃ PO ₄) for <i>Orobanche ramosa</i> Control in Potato	AGSC	M. Haidar	4,721
Zoonotic Diseases	Avian Influenza Viruses Carried by Domestic and Migrating Birds Across the Lebanese Territory	ANSC	E. Barbour	5,533
Animal nutrition	Differences in Digestibility, Blood and Urine Parameters between Water and Feed Restricted Awassi Ewes	ANSC	S. Hamadeh	4,812
Clinical Nutrition	Interaction between Fat Mass, Insulin Resistance, Bone and the Vitamin D-PTH Axis in Overweight (BMI≥85th percentile) Pre-Adolescent Children and Adolescents in Lebanon.	NFSC	N. Hwalla	5,425
Cereal Science	Formulation of Selenium-Fortified Arabic Bread	NFSC	I. Toufeili	5,350
Mycotoxins	Determination of Aflatoxin M1 in Some Dairy Products Consumed in Lebanon: Comparison between Seasons and Sources of Milk Products	NFSC	Z. Kassaify	6,000
Food Sensory Analysis	Designing an Arabic Version of the 9-point Hedonic Scale for Use in Acceptability Tests	NFSC	A. Olabi	5,834
Integrated Pest Management	Cucurbit Yellow Stunting Disorder Virus: Sensitivity of Detection Methods and Development of Resistant Transgenic Plants	PLSC	Y. Abou-Jawdah	4,725
Agronomy	Effects of Rotation: Comparing Barley Performance after a Previous Crop of Safflower, Chickpea, or Barley	PLSC	S.K. Yau	4,322
Environment	Oil spill contaminants in selected vertebrates and invertebrates of the Eastern Mediterranean*	ANSC	E. Barbour	5,000
Total				51,722

* AUB Task Force for Reconstruction and Community Service; all others are supported by URB

Table 11. Funded Research: Lebanese National Council for Scientific Research (LNCSR)

Research Area	Title	Dept.	Investigator (PI)	Budget USD
Immunology	Relationship of Water Deprivation–Stress to Immunity in Awassi Ewes of Lebanon (Extension)	ANSC	E. Barbour	5,000
Animal Nutrition	Nutritional Values of De-Hulled Safflower Meal for Poultry.	ANSC	M. Farran	8,954
Animal nutrition	Fat Mobilization and Some Hormonal Changes in Dry Awassi Ewes in Response to Water Stress and Vitamin C Supplementation	ANSC	S. Hamadeh	6,000
Clinical Nutrition	Diet and Physical Activity as Determinants of Non-Communicable Disease Risk Factors in Lebanon.	NFSC	N. Hwalla	6,000
Food Sensory Analysis	Taste Acuity before and after Gastric Banding and Roux-en-Y Bastric Bypass Surgery in Morbidly Obese Subjects	NFSC	A. Olabi	4,667
Integrated Pest Management	Identification and Evaluation of Local Strains of Fungi and Viruses as Biological Contro Agents of Pests of Major Economic Significance in Lebanon	PLSC	Y. Abou-Jawdah	4,666
Agronomy	Preliminary Evaluation of Conservation Tillage in Lebanon - Phase I (2006)	PLSC	S.K. Yau	5,200
Agronomy	Preliminary Evaluation of Conservation Tillage in Lebanon - Phase I (May 2007 – Apr 2008)	PLSC	S.K. Yau	4,819
Integrated pest management	Disease Forecasting for the Management of Epidemic Diseases on Apple and Potato in Lebanon	PLSC	A. Saad	4,000
Total				49,306

Appendix 2

Publications, Theses and Reports

1. Refereed Journals

Animal Sciences

Barbour, E. K., Jaber, L. S., and **Farran, M. T.** 2007. Thermostabilizers in poultry live vaccines. *World Poultry*, 23 (8): 43-44.

Barbour, E. K., Rayya, E. G., Shaib, H. A., El Hakim, R. G., Abdel Nour, A. M., Niedzwiecki, A., Harakeh, S., and Rath, M. 2007. Holistic efficacy of specific nutrient synergy against avian flu virus: pathology and immunomodulation. *Veterinaria Italiana*, 43(1): 43-54.

Barbour, E. K., Rayya, E. G., Shaib, H. A., El Hakim, R. G., Abdel Nour, A. M., Niedzwiecki, A., Rath, M., and Harakeh, S. 2007. Alleviation of histopathologic effects of avian influenza virus by a specific nutrient synergy. *International Journal of Applied Veterinary Medicine*, 5(1): 9-16.

Barbour, E. K., Shaib H. A., and Rayya E. G. 2007. RT-PCR based surveillance of type A influenza viruses in wild and domestic birds of Lebanon. *Veterinaria Italiana*, 43(1):33-41.

* Kassaify, Z. G., El Hakim, R. G., Rayya, E. G., Shaib, H. A., and **Barbour, E. K.** 2007. Preliminary study on the efficacy and safety of eight Individual and blended disinfectants against poultry and dairy Indicator organisms. *Veterinaria Italiana*, 43(4): 821-830.

Tayeb, I. T., Nehme, P. A., Jaber, L. S., and **Barbour, E. K.** 2006. Competitive exclusion in chicken layers against Salmonella Enteritidis by yoghurt microbiota: Impact on egg production, protection, and yolk-antibody and cholesterol levels. *Journal of Applied Microbiology*, 102(5): 1330-1336.

Tayeb, I. T., Nehme, P., Jaber, L., and **Barbour, E. K.** 2007. Development of an Enzyme-Linked Immunosorbent Assay for quantification of Salmonella Enteritidis-specific antibodies in egg yolk. *Brazilian Journal of Poultry Science*, 8(4): 257-263.

Plant Sciences

Darwish, M. R., Sharara, M., Sidahmed, M., and **Haidar, M.** 2007. The Impact of a Storage Facility on Optimality Conditions of Wastewater Reuse in Land Application: A Case Study in Lebanon. *Journal of Resources, Conservation and Recycling*, 51(1): 175-189.

El-Mohtar, C., Atamian, H., Dagher, R., **Abou-Jawdah, Y.**, Salus, M., and Maxwell, D. 2007. Marker assisted selection of tomato genotypes with I2 gene of resistance to *Fusarium oxysporum* f. sp. *lycopersici*. *Plant Disease*, 91: 758-762.

El-Najjar, N., Saliba, N., **Talhok, S.**, and Gali-Muhtasib, H. 2007. Induction of apoptosis and protection against 1, 2-dimethylhydrazine induced colon cancer by the extract of *Onopordum cynarocephalum*, *Oncology Reports*. *Oncology Reports*, 17(6): 1517-23.

* indicates collaborative publications listed under more than one department.

Nemer, N., **Kawar, N. S.**, Kfoury, L., and Frerot, B. 2007. Evidence of sexual attraction by pheromones in the cedar web-spinning sawfly. *Canadian Entomologist*, 139(5): 713-721.

Sattout, E. J., **Talhouk, S. N.**, and Caligari, P. D. S. 2007. Economic value of cedar relics in Lebanon: An application of contingent valuation method for conservation. *Ecological Economics*, 61(2-3): 315-322.

Stephan, J., Lauri, P., Dones, N., Haddad, N., **Talhouk, S. N.**, and Sinoquet, H. 2007. Architecture of the Pruned Tree: Impact of Contrasted Pruning Procedures Over 2 Years on Shoot Demography and Spatial Distribution of Leaf Area in Apple (*Malus domestica*). *Annals of Botany*, 99(6): 1055-1065.

Sweiss, M., Anfoka, G., and **Abou-Jawdah, Y.** 2007. Molecular characterization of Jordanian isolates of Cucurbit yellow stunting disorder virus. *Journal of Phytopathology*, 155(9): 557-562.

Temsah, M., Hanna, L., and **Saad, A. T.** 2007. Anatomical observations of *Pseudomonas savastanoi* on *Rhamnus alaternus*. *Forest Pathology*, 37(1): 64-72.

Temsah, M., Hanna, L., and **Saad, A. T.** 2007. Histological Pathogenesis of *Pseudomonas savastanoi* on *Myrtus communis*. *Journal of Plant Pathology*, 89(2): 241-249.

Yau, S. K. 2007. Winter versus spring sowing of rain-fed safflower in a semi-arid, high-elevation Mediterranean environment. *European Journal of Agronomy*, 26(3): 249-256.

* **Yau, S. K.**, Nimah, M., and Touffeili, I. 2006. Quality and yield of saffron strains at contrasting Mediterranean sites. *Experimental Agriculture*, 42: 399-409.

Zahreddine, H. G., Struve, D. K., and **Talhouk, S. N.** 2007. *Cercis siliquastrum* L., *Malus trilobata* Schneid and *Acer syriacum* Boin and Gaill water use as affected by two fertilizer rates. *Scientia Horticulturae*, 112(1): 99-107.

Zahreddine, H. G., Struve, D. K., and **Talhouk, S. N.** 2007. Growth and nutrient partitioning of containerized *Cercis siliquastrum* L. under two fertilization regimes. *Scientia Horticulturae*, 112(1): 80-88.

Land and Water Resources

* **Darwish, M. R.**, Sharara, M., **Sidahmed, M.**, and Haidar, M. 2007. The Impact of a Storage Facility on Optimality Conditions of Wastewater Reuse in Land Application: A Case Study in Lebanon. *Journal of Resources, Conservation and Recycling*, 51(1): 175-189.

Nimah, M. N. 2007. Cucumber yield under deficit Irrigation and mulching treatments. *ACTA Horticulturae*, 731: 189-195.

* indicates collaborative publications listed under more than one department.

Nutrition and Food Sciences

Bassil, M. S., **Hwalla, N.**, and **Obeid, O. A.** 2007. Meal patterns in male rats following amino acid manipulation of the diet: Effect of histidine, leucine and tyrosine. *Obesity Research*, 15: 616-623.

Bassil, M. S., Mrayati, M., **Hwalla, N.**, and **Obeid, O. A.** 2007. The immediate effect of leptin and ghrelin injection on in vivo postprandial glycogen and lipid synthesis in rats. *Annals of Nutrition and Metabolism*, 51(1): 14-21.

Batal, M., and Hunter, B. 2007. Traditional Lebanese recipes based on wild plants: an answer to diet simplification? *Food and Nutrition Bulletin*, 28(2): S303-S311.

Cody, T., **Olabi, A.**, Pettingell, A., Tong, P., and Walker, J. 2007. Evaluation of rice flour for use in vanilla ice cream. *Journal of Dairy Science*, 90: 4575-4585.

Haddad, Y., Haddad, J., **Olabi, A.**, Shuayto, N., Haddad, T., and **Toufeili, I.** 2007. Mapping Determinants of Purchase Intent of Concentrated Yogurt (Labneh) by Conjoint Analysis. *Food Quality and Preference*, 18(5): 795-802.

Jackson, R. T., Rashed, M., Al-Hamad, N., **Hwalla, N.**, and Al-Somaie, M. 2007. Comparison of BMI-for-age in adolescent girls in 3 countries of the Eastern Mediterranean Region. *Eastern Mediterranean Health Journal*, 13(2): 430-40.

* **Kassaify, Z.G.**, El Hakim, R.G., Rayya, E.G., Shaib, H.A., and Barbour, E.K. 2007. Preliminary study on the efficacy and safety of eight Individual and blended disinfectants against poultry and dairy Indicator organisms. *Veterinaria Italiana*, 43(4): 821-830.

Saoud, I. P., **Batal, M.**, Ghanawi, J., and Lebbos, N. 2007. Seasonal variation in highly unsaturated fatty acid composition of muscle tissue of two fishes endemic to the Eastern Mediterranean. *Ecology of Food and Nutrition*, 46(2): 77-89.

Toufeili, I. 2007. Comprehensive Review of Scientific Literature Pertaining to Nitrogen Protein Conversion Factors. Bulletin of the International Dairy Federation 405. *International Journal of Dairy Technology*, 60(3): 235-236.

2. Books

Animal Sciences

Hamadeh, S. K., Haidar, M., and Zurayk, R. 2006. Research for Development in the Dry Arab Region (Arabic Version). Arab Scientific Publishers, Beirut, 160pp.

* indicates collaborative publications listed under more than one department.

Plant Sciences

* Hamadeh, S. K., **Haidar, M.**, and Zurayk, R. 2006. Research for Development in the Dry Arab Region (Arabic Version). Arab Scientific Publishers, Beirut, 160pp.

Land and Water Resources

* Hamadeh, S. K., Haidar, M., and **Zurayk, R.** 2006. Research for Development in the Dry Arab Region (Arabic Version). Arab Scientific Publishers, Beirut, 160pp.

3. Edited Books & Journals

Animal Sciences

Barbour, E. K. 2006. "Plurithematic Issue of *the Scientific and Technical Review*, 2006", December 2006, Office International Des Epizooties, World Organization for Animal Health, Paris, France, pp. 873-1181.

Barbour, E. K. 2007. "Animal Vaccination, Part 1: development, production, and use of vaccines", Office International Des Epizooties, World Organization for Animal Health, Paris, France, pp. 1-291.

4. Chapters in Books

Plant Sciences

Abou-Fakhr Hammad, E. M. 2006. Botanicals: An Alternative in Pest management. In R. Dris (Ed.) *CROPS: Growth, Quality & Biotechnology, Current Status and future prospects* (pp. 119-148). WFL Publisher, Helsinki, Finland.

Abou-Fakhr Hammad, E. M. 2006. Insect and Mite Pests and their Natural Enemies (Parasitoids and/or Predators) in the Middle East. In J. L. Capinera (Ed.) *Encyclopedia of Entomology* (pp. 497-504). Kluwer Academic Publishers, Hingham (MA), USA.

Nutrition and Food Sciences

Hwalla, N. 2007. Lebanese Traditional Diets and Health effects. In F. De Messter, and W. R. Ronald (Ed.) *Wild-type Food in Health Promotion and Disease Prevention: The Columbus Concept* (pp. 493-498). Humana Press, Totowa, New Jersey.

Toufeili, I., and Özer, B. 2006. Brined Cheeses from the Middle East and Turkey. In A. Y. Tamime (Ed.) *Brined Cheeses* (pp.188-210). Blackwell Publishing, New York.

* indicates collaborative publications listed under more than one department.

5. Manuals and Chapters in Manuals

Land and Water Resources

Bashour, I. 2007. Fertilization Forage Crops. In *Near East Fertilizer-use Manual* (pp. 145 – 148). FAO, Rome, Italy.

Bashour, I. 2007. Fertilization Fruit Crops. In *Near East Fertilizer-use Manual* (pp.125-144). FAO, Rome, Italy.

Bashour, I. 2007. Fertilization of Cereal Crops. In *Near East Fertilizer-use Manual* (pp. 75 – 89). FAO, Rome, Italy.

Bashour, I. 2007. Fertilization of Highly Sandy Soils – Desert Farming. In *Near East Fertilizer-use Manual* (pp. 43 – 50). FAO, Rome, Italy.

Bashour, I. 2007. Mineral Fertilizers in the Markets of the Near East. In *Near East Fertilizer-use Manual* (pp.63-69). FAO, Rome, Italy.

Bashour, I., and El-Fouly, M. 2007. Soil and Plant Tissue Sampling Methods. In *Near East Fertilizer-use Manual* (pp.7-14). FAO, Rome, Italy.

Sayegh, A., and **Bashour, I.** 2007. Fertilization of Calcareous, Gypsiferous, and Salt-affected Soils. In *Near East Fertilizer-use Manual* (pp.19-25). FAO, Rome, Italy.

6. Abstracts, Proceedings, Papers, Posters, oral Presentations in International Conferences

Animal Sciences

Barbour, E. K. 2007. Evaluation of the immunomodulating capacity of orally administered microdoses of a combination of *Echinacea* extracts and its safety and efficacy in the control of *E. coli* infections in commercial poultry. Oral presentation: *15th Congress of the World Veterinary Poultry Association*. September 12-18, 2007, Beijing, China.

Barbour, E. K., Raya, E. G., Shaib, H., El Hakim, R. G., Niedzwieck, A., Abdel Nour, A. M., Rath, M., and Harakeh, S. 2007. Pathologic effects of a specific Nutrient Synergy against Avian Flu Virus. *2nd International Conference on Avian Influenza in Humans: Recent Developments and Perspectives (Paris: Anti-Avian Influenza 2007)*. May 31-June 1, 2007, Institut Pasteur, Paris, France.

Gharib C., Haidar M. A., **Sleiman F. T.,** and Sidahmed M. M. 2007. Germination and viability of dodder seeds after digestion in sheep rumen. *The 9th World Congress of Parasitic Plants*. June 3-7, 2007, Charlottesville, Virginia, USA.

* indicates collaborative publications listed under more than one department.

Haidar, M. A., Gharib, C., **Sleiman, F. T.**, and Sidahmed, M. M. 2007. Effect of Sheep Rumen Digestion on Germination and Viability of Common Weed Seeds of Lebanon. *Proceedings of the 47th Weed Science Society of America*, Abstracts (254). February 5 – 8, 2007, Texas, USA.*

Plant Sciences

Fahed, S. C., and **Saad, A. T.** 2007. Management of cucumber downy mildew in organic agriculture. *Phytopathology* 96: S34.

* Gharib C., **Haidar M. A.**, Sleiman F. T., and Sidahmed M. M. 2007. Germination and viability of dodder seeds after digestion in sheep rumen. *The 9th World Congress of Parasitic Plants*. June 3-7, 2007, Charlottesville, Virginia, USA.

Haidar, M. A., Gharib, C., Sleiman, F. T., and Sidahmed, M. M. 2007. Effect of Sheep Rumen Digestion on Germination and Viability of Common Weed Seeds of Lebanon. *Proceedings of the 47th Weed Science Society of America*, Abstracts (254). February 5 – 8, 2007, Texas, USA.

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Yau, S. K. 2006. Early sowing and irrigation on barley yield in a cool Mediterranean area. In Abstracts (CD format) of the *International Annual Meeting of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America*. November 12-16, 2006, Indianapolis, USA.

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Yau, S. K., and Sarkar, A. 2006. Crop breeding achievements for increased crop productivity, (Invited plenary presentation). *Proceedings of the Preliminary Symposium for the 5th International Crop Science Congress*. November 30-December 2, 2006, Jeju, South Korea,.

* indicates collaborative publications listed under more than one department.

Land and Water Resources

Alameddine, A. Y., **Bashour, I.** 2007. Ammonium Hydroxide and Hydrogen Peroxide amendments for the control Root-Knot Nematodes. *58th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy 2007*. February 25 – March 2, 2007, Chicago, Illinois.

Azar, G., Habib, R. R., Nuwayhid, I., Jurdi, M., El Fadel, M., and **Zurayk R.** 2006. Applying Ecohealth to Water and Health Research in Bebnine, Lebanon. *International Conference on Ecosystem approaches to Human Health*. July 2006, USA.

Darwish, M. R. 2006. Analysis of Production Costs and Determination of Product Prices. *Training Manual and workshop presentation for farmers in North Lebanon*. November 2006, Lebanon.

Darwish, M. R. 2006. Maximizing Monetary Returns to Farm Communities Using Storage Facilities in Wastewater Reuse Management: The Case of Tyre Region, Lebanon. *Arab Academy of Science's Symposium on Integrated Water Resources Management in the Arab Region*. December 14 -16, 2006, Beirut, Lebanon.

Farajalla, N. S. 2007. War and Water Resources. *Lebanon Rapid Environmental Assessment for Greening Recovery, Reconstruction and Reform – 2006*. Edited by R. Khoury, UNDP.

Farajalla, N. S., 2006. Integrated Development of Wadi Systems in Lebanon. *Arab Academy of Science's Symposium on Integrated Water Resources Management in the Arab Region*. December 14 -16, 2006, Beirut, Lebanon.

Farajalla, N. S., and P. I. Saoud, 2006. Aquaculture: The Potential for Multiple Usages of Water Resources to Increase Water Value Index. *The 3rd International Conference on the "Water Resources in the Mediterranean Basin"*, WATMED 3. November 1-3, 2006, Tripoli, Lebanon.

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Nimah, M. N. 2006. Challenges for Irrigated Agriculture: Coping With Water Scarcity. Integrated Water resources management in the Arab region. *Arab Academy for Science, ISESCO, UNESCO, UNEP and AUB*. December 15-16, Beirut, Lebanon.

Nimah, M. N. 2006. Localized and/or Trickle Irrigation. *Proceedings of The ACSAD Training Workshop "Designing, Evaluating and Installing different Irrigation Systems: For trainees from English-speaking African countries"*. Nov. 5 – Dec. 6, 2006, Douma, Syria.

* indicates collaborative publications listed under more than one department.

Nimah, M. N. 2007. Potato response to water stress at different growth stages. Workshop on production and certification of seed potato. *MERC USAID*, Tiznit, Morocco. March, 21 – 26, 2007.

Nimah, M. N. and **Farajalla, N.** 2007. Fresh water issues in Lebanon. *Cornell University, American University of Beirut and American University of Cairo workshop*. March 18 – 20, 2007. Cairo, Egypt.

Nimah, M. N. and Moukarzel, S. 2007. Water Productivity: A new concept for improving irrigation water use efficiency. *International Conference of the ASABE*. June 2007, Minnesota, USA.

Nimah, M. N., and Saoud, I. 2006. Impact of Post war on Fisheries and Agriculture. *NDU and Ministry of Electricity and Water Conference*. October 4th, 2006.

Nimah, M. N., Moukarzel, S. N., **Darwish, M. R.**, **Farajalla, N.**, and **Bashour, I.** 2006. Water Productivity a basic tool for sustainable Irrigation. Transaction of Wessex Institute of Technology: Sustainable Irrigation management, Technologies, and policies. *WIT Press*: 127-137.

Saoud, I. P. and **Farajalla, N. S.** 2006. Multiple Usages of Freshwater Resources Increase Water Value Index while Conserving Limited Supply. *Arab Academy of Science's Symposium on Integrated Water Resources Management in the Arab Region*. December 14 - 16, 2006, Beirut, Lebanon.

Sidahmed, M. 2007. Cone Index before and after Ploughing of Stony Clay Soil as a Function of Depth and Moisture. *ASABE Annual International Meeting*. June 17-20, Minneapolis, USA.

Zurayk, R. 2006. Participate to the “réunion de réflexion sur Assurer la sécurité alimentaire quantitative et qualitative dans les pays méditerranéens”. November 2-3, 2006, France.

Nutrition and Food Sciences

Cassab, M., and **Toufeili, I.** 2006. Identification of some selected rancidity indices at end of shelf life of sesame seed oil. *IFT Annual Meeting and Food Expo*. June 24-28, Orlando, Florida.

Hwalla, N. 2006 Regional training course on “The Use of Stable Isotopes to Assess Nutritional Status of Adults and Children”. *International Atomic Energy Agency in collaboration with the Government of the Hashemite Kingdom of Jordan*.

Hwalla, N., El Khoury, D., **Obeid, O.**, and Azar, S. 2006. Variation in postprandial ghrelin status following ingestion of high carbohydrate, high fat and high protein meals in healthy males. *FASEB J.* 2006; 20: A575.

* indicates collaborative publications listed under more than one department.

Jinjarak, S., Morin, P., **Olabi, A.**, and Jimenez-Flores, R. 2006. Sensory evaluation of a novel ingredient produced from buttermilk. *ADSA/ASAS Joint Annual Meeting*. July 9-13, Minneapolis, Minnesota.

Kassaify, Z. G., Hamzeh, R. 2007. Food Safety issues during crisis in the Middle Eastern region. In a Symposium: Management of food storage, handling and distribution during times of crisis. *The IFT Annual Meeting and Food Expo*. July 28-August 1, Chicago Illinois.

Kassaify, Z. G., Hamzeh, R. 2007. The Effects of Nisin as Inhibitor of *Listeria Monocytogenes* in Kashta at Refrigeration Temperatures. *The IFT Annual Meeting and Food Expo*. July 28-August 1, 2007, Chicago Illinois.

Kassaify, Z. G., **Toufeili, I.**, and Badaoui-Najjar, M. 2006. The microbiological and chemical quality of Lebanese kashta (heat-coagulated milk). *The IFT Annual Meeting and Food Expo*. June 24-28, Orlando, Florida.

Olabi, A. and Lawless, H. 2007. Persistence of context effects after training and with intensity references. *The IFT Annual Meeting and Food Expo*. July 28-August 1, Chicago Illinois.

7. Published Research Reports

Land and Water Resources

Bashour, I. 2006-2007. Non Nutritive Trace Elements content of Synthetic Fertilizers in Lebanon (5,569 USD budget). University Research Board.

Farajalla, N. 2006-2007. Assessment of the Chemical Composition of Rainwater in Lebanon after the July 2006 War on Lebanon (14,000 USD budget). United Nations Environment Programme (UNEP).

Farajalla, N. 2006-2007. Emerging Contaminants in the Environment in Lebanon: Antibiotics and Growth Hormones from Poultry and Dairy Operations (5,425 USD budget). University Research Board.

Farajalla, N. 2007. Biodiversity Assessment and Monitoring in Palm Island Nature Reserve, Lebanon (IUCN/MoE). (25,000 USD budget).

Nimah, M. 2006-2007. Effect of deep root irrigation, and strip irrigation on yield and irrigation efficiency (4,644 USD budget). University Research Board.

Nimah, M. 2007. Modeling the effects of deficit irrigation and depth of root wetting on irrigation water saving, crop yield and quality, and water productivity. Lebanese National Council for Scientific Research.

Padilla M., Hamimaz, R., El Dahr, H, **Zurayk, R.**, and Moubarak, F. 2006. "Consumers and the health and environmental quality of products". In *Agri-Med: Agriculture, fisheries, food and sustainable development in the Mediterranean Region*, Hervieu Bertrand (dir.); Allaya Mahmoud (coord.). Centre International de Hautes Etudes Agronomiques Méditerranéennes (CIHEAM), Section I, pp 1-30 and Section III, pp195-253, Annual Report 2006.

Sidahmed, M. 2006-2007. Development and Testing of Spray Hazard Classification System for the Developing Countries (3,741 USD budget). University Research Board.

Zurayk, R. 2004-2007. Understanding Water, Understanding Health: The Case of Bebnine (340,981.02 USD). IDRC.

Zurayk, R. 2005-2007. Global Environment Outlook (GEO 4). (10,000 USD budget). United Nations Environment Program.

Zurayk, R. 2005-Ongoing. Regional Training and Knowledge Sharing in Urban Agriculture for the Middle East and North Africa –2005-2006. Offering a regional training course on Urban Agriculture (471,980 CAD budget). Cities Feeding People Initiative of the International Development Research Center.

Zurayk, R. 2005-Ongoing. Regional Training and Knowledge Sharing in Urban Agriculture for the Middle East and North Africa – 2005-2006 (471,980 CAD). Cities Feeding People Initiative of the International Development Research Center.

Zurayk, R. 2006. Cities Farming for the Future. (36,937.60 USD budget). RUAF Foundation.

Zurayk, R. 2006-2007. Biodiversity conservation through use: Laurel soap to enhance women's livelihoods in Aita al Shaab. Post-war reconstruction effort (15,000 USD budget). SEAL-USA.

Zurayk, R. 2006-2007. Mobile Rural Community Development Centre. Management of a mobile community development center to serve the South in the post war period (45,000 USD budget). SEAL-USA and Heinrich Boell Foundation, Germany.

Nutrition and Food Sciences

Kassaify, Z.G. 2006. The Microbiological Assessment of the Red Meat and Poultry Sectors in Lebanon. In collaboration with UNIDO.

8. Theses

MSc Theses Submitted

Animal Sciences

Al Kadi, Akram N.: Performance and egg quality of laying hens fed mineral proteinates or amino acid chelates. *Major: Animal Sciences. Advisor: Dr. Mohamad Farran.*

El-Hajj, Rana: Indicators of Microbial Pollution, Drug Resistance, & Heavy Metals Recovered from Different Species of Edible Oysters in the Eastern Mediterranean. *Major: Ecosystem Management. Advisor: Dr. Elie Barbour.*

El-Hakim, Rindala: Natural and synthetic molecules against dairy and poultry diseases.

Major: Poultry Science. Advisor: Dr. Elie Barbour.

Gerges, Danyelle: Anti-*Candida albicans* properties of essential oil indigenous herbs in Lebanon (Animal Sc.). *Major: Animal Sciences. Advisor: Dr. Elie Barbour.*

Ghadban, Elias: A modified sustainability model (idea) to compare organic and conventional agricultural systems in the Bekaa plain of Lebanon. *Major: Plant Sciences. Advisor: Dr. Shady Hamadeh.*

Rayya, Edward: Avian Influenza in migratory and domestic birds and impact of therapeutic molecules against poultry viruses. *Major: Poultry Science. Advisor: Dr. Elie Barbour.*

Sabra, Alia: Oil spill impact on bivalves of the Lebanese coast. *Major: Ecosystem Management. Advisor: Dr. Elie Barbour.*

Plant Sciences

Atamian, Hagop S: Breeding Lebanese tomato landraces for combined resistance to *Tomato yellow leaf curl virus*, root-knot nematode and two vascular wilt diseases. *Major: Plant Protection. Advisor: Dr. Youssef Abou-Jawdah.*

Dagher, Rachel B.: Breeding local tomato for combined resistance to *Tomato yellow leaf curl virus*, *Verticillium* and *Fusarium* wilt diseases. *Major: Plant Protection. Advisor: Dr. Youssef Abou-Jawdah.*

Hamdan, Khaled: The conservation Of Orchid Species in Lebanon: A Holistic Approach. *Major: Ecosystem Management. Advisor: Dr. Salma Talhouk.*

Modad, Nadine: Survey and Speciation of the Wild Mushrooms of Lebanon. *Major: Ecosystem Management. Advisor: Dr. Adib Saad.*

Land and Water Resources

Al Assi, Haya: The Diet of *Fistularia commersonii* alessespsian piscivore in The Mediterranean Sea. *Major: Ecosystem Management. Advisor: Dr. Rami Zurayk.*

Alameddine, Alia: Efficacy of Ammonium Hydroxide and hydrogen peroxide for the Control of Root Knot Nematode, *Fusarium* and *Verticillium* Wilt. *Major: Soils. Advisor: Dr. Isam Bashour.*

Aoun, Nadine: Acid Rain and Chemical Composition of Rainwater in Lebanon. *Major: Irrigation. Advisor: Dr. Nadim Farajalla.*

Karameh, Joumana: Economic Assessment of the Agricultural Extension Service in Lebanon: Current Status And Its Role In Agricultural Development. *Major: Agricultural Economics. Advisor: Dr. Ragy Darwish.*

Mhanna, Maya: Modeling Temperature Trends in Lebanon. *Major: Irrigation. Advisor: Dr. Nadim Farajalla.*

Rachid, Grace: Evolution of Natural Resource Management in Mount Lebanon: The Case Of Batloun El- Shouf 1935-2005. *Major: Ecosystem Management. Advisor: Dr. Rami Zurayk.*

Wakim, Rita: Selenium Levels in Selected Lebanese Soils, Grains, Vegetables and Fruits. *Major: Soils. Advisor: Dr. Isam Bashour.*

Yammine, Maya: Impact of Landmines and Unexploded Ordnance on the Human & Land Resources in South Lebanon. *Major: Ecosystem Management. Advisor: Dr. Rami Zurayk.*

Nutrition and Food Sciences

Adel Abdel-Ahad Hasbani, Nadine: Absorption of calcium from Arabic bread fortified with different calcium salts. *Major: Nutrition and Food Sciences. Advisor: Dr. Omar Obeid.*

El Fakhani, Manal Said: Assessment of plasma copper, Zinc and selenium status in Lebanese adults. *Major: Nutrition. Advisor: Dr. Omar Obeid.*

Farhat, Cynthia: Analysis of Indigenous Nutritional Knowledge, Cultural Importance and Nutritional Content of Wild Edible Plants. *Major: Nutrition. Advisor: Dr. Malek Batal.*

Haddad, Yasmine: Analysis of Factors Influencing Purchase Intent of Concentrated Yogurt (Labneh). *Major: Food Technology. Advisor: Dr. Imad Toufeili.*

Hassan, Hussein: Determination of Aflatoxin M1 in Some Dairy Products Consumed in Lebanon: Comparison between Seasons and Sources of Milk Products. *Major: Food Technology. Advisor: Dr. Zeina Kassaify.*

Helou, Nancy: Effect of macronutrient composition of meals on post-prandial PYY responds in obese female subjects. *Major: Nutrition. Advisor: Dr. Nahla Hwalla.*

Jamal, Zeina: Hepatic fuel partitioning of copper deficient rats following starch and fructose manipulation of the diet. *Major: Nutrition. Advisor: Dr. Omar Obeid.*

Maalouf, Joyce: Interaction between dietary calcium, exercise and leptin and their impact on musculoskeletal parameters in children and adolescents. *Major: Nutrition and Food Sciences. Advisor: Dr. Nahla Hwalla.*

Marji, Maya: Liver status of rats maintained on a high-protein diet with varied vitamin B6 and fat levels. *Major: Nutrition. Advisor: Dr. Omar Obeid.*

Movahedi, Ariyo: Postprandial and chronic effects of basil seed, husk of psyllium and black seed on blood parameters in female rats. *Major: Nutrition. Advisor: Dr. Nahla Hwalla.*

Nouweiry, Jamal: Effect of metformin on weight loss and body composition in obese insulin resistant subjects fed either low carbohydrate or high carbohydrate diet. *Major: Nutrition. Advisor: Dr. Nahla Hwalla.*

Saade, Carole: Fatty Acid Composition, Including Trans Fatty Acids, of Local and Regional Snack Foods in the Lebanese Market. *Major: Food Technology. Advisor: Dr. Imad Toufeili.*

PhD Theses Supervision

Nutrition and Food Sciences

Chamieh, Marie Claire: Dietary and socioeconomic determinants of overweight and obesity in Lebanon. *Advisor: Dr. Nahla Hwalla.*

Tannous, Dalia: Effect of macronutrient composition of males on postprandial ghrelin response in hyper-insulinemic male subjects. *Advisor: Dr. Nahla Hwalla.*

9. Technical and Consultancy Reports (services to community)

Plant Sciences

- **Dr. Youssef Abou-Jawdah**

Held or participated in 23 lectures/farmer workshops (23 days) on Integrated Pest Management during summer 2007. Technical sheets were distributed to farmers on the following topics:

- 1- Principles of IPM
- 2- IPM in vegetable crops
- 3- IPM in fruit crops
- 4- IPM in potato
- 5- Introduction on greenhouse production

- **Dr. M. Haidar**

Haidar M.A. 2007. Integrated weed management in orchards, Shlifaa, MerciCorps, Pamphlet 5 pages.

Haidar M.A. 2006. Training the Trainers on “Weed biology and management”, Beirut, Lebanon. *Sponsored by World Vision.*

- **Dr. Adib Saad**

Saad, A. 2007. Lebanon Methyl Bromide Alternatives Project for the Strawberry Sector. UNIDO Project No.: MP/LEB/01/184

Land and Water Resources

- **Dr. Rami Zurayk**

GEO 4 Launch (Final Report)

Study for the inventory of typical Lebanese products (Final report)

Cities Farming for the Future. (Final report)

Mobile Rural Community Development Centre. (Final report)

Regional Training and Knowledge Sharing in Urban Agriculture for the Middle East and North Africa (Progress Reports)

Global Environment Outlook (GEO 4) (Final report)

Nutrition and Food Sciences

- **Dr. Nahla Hwalla**

Organized and conducted a workshop on “Dietary Management for Diabetes”, E.I.Lilly company, Tehran.

The First Research Coordination Meeting (RCM) on “Body fat and its relationship with metabolic syndrome indicators in overweight pre-adolescents”. International Atomic Energy Association (IAEA), Vienna.

Participated in “Loose weight while eating, obesity in children, mediterranean diet, and sports nutrition” at the “2eme Congres de la Faculte de pharmacie”. Faculte de pharmacie (USJ), Lebanon.

Appointed by DG of WHO as a member of the “WHO Expert Advisory Panel on Nutrition” for four years 2004-2008.

Food-Based Dietary Guidelines for the Eastern Mediterranean Region. Technical Report submitted to WHO.

- **Dr. Zeina Kassaiy**

A written report on the AREC Cafeteria: its GMP and Safety. March 2007.

Technical Report to Minister of Public Health on Foodborne Incidences and Control Measures for his presentation to WHO, April 2007.

A Report to the Lebanese Army on the investigation of the spoilage of canned processed meats and processed cheese (October 2006)

A Report to the International Red Cross Organization and the Ministry of Environment, Lebanon on the investigation of the spoilage of canned Turkey meat samples (September 2006).