

# Jay J. Cao, Ph.D.

Research Nutritionist

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## **EDUCATION:**

University of Florida, Gainesville, FL  
Ph.D., Animal Nutrition, 1998

McGill University, Montreal, Canada  
M.Sc., Animal Nutrition, 1994

Nanjing Agricultural University, China  
B.S., Animal Science, 1985

## **WORKING EXPERIENCE:**

2006 – Research Nutritionist,  
USDA ARS Grand Forks Human Nutrition Research Center

2005-2006 Scientist, Melaleuca Inc., Idaho Falls, Idaho

2001 – 2005 Postdoc in bone biology, Univ of California at San Francisco

1998 – 2001 Postdoc in zinc nutrition, Univ of Florida, Gainesville, FL

## **PROFESSIONAL SERVICES:**

Variable Ad Hoc manuscript reviewer

- American J of Clinical Nutrition
- American J of Physiology - Endocrinology and Metabolism
- Biological Trace Element Research
- Biomed Central Genomics
- Bone
- British J of Nutrition
- Clinical Medicine Insights: Therapeutics
- J of American College of Nutrition
- Journal of Animal Physiology and Animal Nutrition
- J Bone and Mineral Research
- J of Agricultural and Food Chemistry
- Journal of the American College of Nutrition
- J Cytology and Histology
- J Endocrinological Investigation
- J Medicinal Food
- Journal of Nutrition
- Journal of Nutritional Biochemistry
- Molecular Nutrition and Food Research
- National Cattlemen's Beef Association
- Nutrition J
- Nutrition Research

- Nutrition & Metabolism
- Lipids
- PLoS One
- USDA ARS GFHNRC
- Yonsei Medical Journal

<u>Variable</u>	<u>Ad Hock Grant reviewer</u>
	<ul style="list-style-type: none"> <li>• Biomedical Research Council, National Medical Research Council, Ministry of Health, Singapore</li> <li>• Florida International University</li> <li>• Institute of Special Animals and Plants, Chinese Academy of Agricultural Sciences, China</li> <li>• National Cattlemen's Beef Association</li> <li>• Ontario Ministry of Agriculture, Canada</li> <li>•</li> </ul>
2012-	Editorial Board Member, J of Orthopaedic Surgery and Research
2012-	Editorial Board Member, J of Food Science and Nutrition
2012-	Editorial Board Member, Scientifica: Rheumatology
2011-	Treasurer, American Chinese Nutrition Society
2011-	Life member, International Chinese Hard Tissue Society
2011	Guest Editor for special issue of "Orthopaedic histology"
2011 -	Editorial Board Member, J Nutrition & Diet Therapy
2010 -	Editorial Board Member, J Cytology & Histology
2010	Chair, Animal Models of Bone Health and Disease mini-symposium, Experimental Biology 2010, Anaheim, CA
2009	Search committee member for three scientist positions at GFHNRC
2009 –	Board member, International Chinese Hard Tissue Society.
2008	Search committee member for Research Nutritionist (ARS-X8W-0250) at GFHNRC
2008	Search committee member for Interdisciplinary: Research Physiologist/Nutritionist/Biologist, ARS-X8W-0248) at GFHNRC
2008	Chair, Bone Health in Animal Models mini-symposium, Experimental Biology 2008, Washington, DC
2008	Chair, Dietary Bioactive Compounds IV: Antioxidants and Free Radicals mini-symposium, Experimental Biology 2008, Washington, DC
2007	Search committee member for nutritionist/research physiologist at GFHNRC
2007-	Webmaster, International Chinese Hard Tissue Society.

**PROFESSIONAL MEMBERSHIPS:**

2002 –	International Chinese Hard Tissue Society (Life member)
2005 –	American Society for Nutrition
2001 –	American Society for Bone and Mineral Research
1998 –	Gamma Sigma Delta (Honorary Agricultural Research Society)
1997 –	Sigma Xi (Honorary Scientific Research Society)
1995 – 1998	American Society of Animal Science

### **RESEARCH SUPPORT:**

Cao, JJ (PI); USDA ARS (Appropriated, 5450-51000-039-00D); Bone Metabolism in Obesity; 04/2010 - 4/2013

Cao, JJ (PI); USDA ARS (Appropriated, 5450-51000-039-00D); Mineral Intakes for Optimal Bone Health; 10/2006 - 4/2010

Cao, JJ (PI); North Dakota Beef Commission; Effects of high meat weight loss diets on bone health; 10/2007 – 6/2009; \$25,000

Cao, JJ (PI); Northharvest Bean Growers Association; High selenium pinto beans as a value-added product in bone metabolism; 7/2007 – 3/2009; \$27,072

Cao, JJ (PI); Northharvest Bean Growers Association; Antioxidant activity in dry beans – potential for pinto beans to slow age-related bone loss; 7/2007 – 12/2008; \$22,743

Cao, JJ (PI) and Hunt JR (Co-PI); National Cattlemen’s Beef Association; Calcium retention in postmenopausal women as influenced by beef and other dietary components that induce an acid load; 10/2007 – 9/2008; \$156,312

### **INVITED TALKS AND CONFERENCE PRESENTATIONS:**

2012. Protein and calcium metabolism. Brown University, January 10.

2011. Protein intake, acid-base balance and calcium metabolism. The 4th New York Skeletal Biology and Medicine Conference, Mount Sinai School of Medicine, April 27-30, New York, NY.

2010. Protein intake, acid-base balance and calcium metabolism. The 5th International Conference on Osteoporosis and Bone Research, October 28-31, Shenzhen, China.

2009. “Acid-base balance and protein intake influence calcium retention and bone health of humans”. Shanghai Jiaotong University School of Medicine, Shanghai, China. (11/3/2009).

2009. “Meat protein, acid-base balance and calcium balance”. Center for Experimental Therapeutics and Reperfusion Injury, Department of Anesthesiology, Perioperative and Pain Medicine, Harvard Medical School, Boston, MA. (4/27/2009).

2009. “A diet high in dietary meat protein and potential renal acid load increases absorption and urinary excretion of calcium, as well as serum IGF-I in postmenopausal women”. Experimental Biology 2009, New Orleans, LA

2009. "Meat protein, Ca balance, and bone health: Results from a controlled study at GFHNRC" Delta Upsilon Fraternity. University of North Dakota. (3/2/2009)

2008. "Effects of Bean Consumption on Cardiovascular Disease Risk Factors and Bone Metabolism Markers in Postmenopausal Women". Northarvest Bean Growers Association. Fargo, ND. (3/2008)

2008. "Relative bone mass decreased in mice fed high dietary fat despite an increase in body mass and bone formation markers". Experimental Biology 2008, San Diego, CA. (4/2008)

2008. "Does Beef Protein Help Rather Than Hinder Calcium Retention in Postmenopausal Women?". North Dakota Beef Commission. Bismarck, ND. (2/26/2008)

2007. "Antioxidant activity in dry beans – potential for pinto beans to slow age-related bone loss". Northarvest Bean Growers Association. Fargo, ND.

2000. "Metallothionein mRNA levels in human mononuclear cells and THP-1 cells undergo major changes by zinc supplementation and depletion". Experimental Biology 2000, Orlando, FL.

## **PUBLICATIONS**

1. **Cao, JJ**, Gregoire BR, Sun L, Song SH. 2012. Alpha-1 antitrypsin reduces ovariectomy-induced bone loss in mice. *Ann New York Acad Sci* 1240 (1): E31-35.
2. Tang H, Yan C, **Cao JJ**, Sarma V, Haura EB, Wu M, Gao H. 2011. An essential role for Stat3 in regulating IgG immune complex-induced pulmonary inflammation. *PASEB J* 25: 4292-4300.
3. Shen CL, Yeh JK, **Cao JJ**, Chyu MC, Wang JS. 2011. Green tea and bone health: Evidence from laboratory studies. *Pharmacol Res* 64: 155-161. (Review)
4. Shen CL, **Cao JJ**, Dagda RY, Tenner TE, Chyu MC, Yeh JK. 2011. Supplementation of green tea polyphenols improves bone microstructure and quality in aged, orchidectomized rats. *Calcif Tissue Int.* 88(6): 455-463.
5. **Cao JJ**, Hunt JR, Johnson LK. 2011. A diet high in meat protein and potential renal acid load increases absorption and urinary excretion of calcium, without affecting markers of bone resorption or formation in postmenopausal women. *J Nutr* 141 (3): 391-397.
6. Shen CL, Samathanam C, Tatum OL, Graham S, Tubb C, **Cao JJ**, Dunn DM, Wang JS. 2011. Green tea polyphenols avert chronic inflammation-induced myocardial fibrosis of female rats. *Inflamm Res* 60: 665-672.
7. **Cao JJ**. 2010. Effects of obesity on bone metabolism. *J Orthopaedic Surgery and Research.* 6: 30.
8. Shen CL, Yeh JK, Samathanam C, **Cao JJ**, Stoecker BJ, Dagda RY, Chyu MC, Dunn DM, Wang JS. 2010. Protective actions of green tea polyphenols and alfacalcidol on bone microarchitecture in female rats with chronic inflammation. *J Nutr Biochem* 22 (7): 673-680.
9. Shen CL, Yeh JK, Samathanam C, **Cao JJ**, Stoecker BJ, Dagda RY, Chyu MC, Dunn DM, Wang JS. 2011. Green tea polyphenols attenuate deterioration of bone microarchitecture in female rats with systemic chronic inflammation. *Osteoporosis Int* 22:327-337.
10. **Cao JJ**, Nielsen FN. 2010. Acid diet (high-meat protein) effects on calcium metabolism and bone health. *Curr Opin Clin Nutr Metab Care.* 13: 698-702. (Review)
11. Yan C, **Cao JJ**, Wu M, Zhang W, Jiang T, Yoshimura A, Gao H. 2010. Suppressor of cytokine signaling 3 inhibits LPS-induced IL-6 expression in osteoblasts by suppressing CCAAT/enhancer-binding protein beta activity. *J Bio Chem.* 285: 37227-39.
12. Shen CL, Yeh JK, **Cao JJ**, Tatum OL, Dagda RY, Wang JS. 2010. Synergistic effects of green tea polyphenols and alphacalcidol on chronic inflammation-induced bone loss in female rats. *Osteoporosis Int* 11: 1841-1852.
13. Shen CL, Yeh JK, **Cao JJ**, Tatum OL, Dagda RY, Wang JS. 2010. Green tea polyphenols mitigate bone loss of female rats in a chronic inflammation-induced bone loss model. *J Nutr Biochem* 10: 968-974.
14. **Cao JJ**, Sun, L, Gao H. 2010. Diet-induced obesity alters bone remodeling leading to decreased femoral trabecular bone mass in mice. *Ann New York Acad Sci* 1192: 292-297.
15. **Cao JJ**, Gregoire BR, Sheng XM, Liuzzi JP. 2010. Pinto bean hull extract supplementation favorably affects markers of bone metabolism and bone structure in mice. *Food Research International* 43: 560-566.
16. Shen CL, Yeh JK, **Cao JJ**, Wang JS. 2009. Green tea and bone metabolism. *Nutr Res* 29: 437-456. (Review)

17. **Cao JJ**, Gregoire BR, Gao, H. 2009. High-fat diet decreases cancellous bone mass but has no effect on cortical bone mass in the tibia in mice. *Bone* 44: 1097 – 1104.
18. **Cao JJ**, Kurimoto P, Boudignon B, Rosen C, Lima F, Halloran BP. 2007. Aging impairs IGF-I receptor activation and induces skeletal resistance to IGF-I. *J Bone Miner Res* 22: 1271 – 1279.
19. **Cao JJ**, Wronski TJ, Iwaniec U, Phleger L, Kurimoto P, Boudignon B, Halloran BP. 2005. Aging increases stromal/osteoblastic cell-induced osteoclastogenesis and alters the osteoclast precursor pool in the mouse. *J Bone Miner Res* 20: 1659 – 1668.
20. **Cao JJ**, Singleton PA, Majumdar S, Boudignon B, Burghardt A, Kurimoto P, Wronski TJ, Bourguignon LYW, Halloran BP. 2005. Hyaluronan increases RANKL expression in bone marrow stromal cells through CD44. *J Bone Min Res* 20: 30 – 40.
21. Sakata T, Wang YM, Halloran BP, Elaieh HZ, **Cao J**, Bikle DD. 2004. Skeletal unloading induces resistance to insulin-like growth factor-I (IGF-I) by inhibiting activation of the IGF-I signaling pathways. *J Bone Miner Res* 19: 436 – 446.
22. **Cao JJ**, Luo XG, Davis SR, Henry PR, Cousins RJ, Miles RD, Ammerman CB. 2003. Tissue zinc and metallothionein expression as criteria for relative bioavailability assays of zinc sources in chicks. *Acta Veterina et Zootechnica Sinica*. 34: 227 – 231.
23. **Cao J**, Venton L, Sakata T, Halloran BP. 2003. Expression of RANKL and OPG correlates with age-related bone loss in male C57BL/6 mice. *J Bone Miner Res* 18: 270 – 277.
24. Cousins RJ, Blanchard RK, Popp MP, Liu L, **Cao J**, Moore JB, Green CL. 2003. A global view of the selectivity of zinc deprivation and excess on genes expressed in human THP 1 mononuclear cells. *Proc Natl Acad Sci* 100: 6952 – 6957.
25. Cousins RJ, Blanchard RK, Moore JB, Cui L, Green CL, Liuzzi JP, **Cao J**, Bobo JA. 2003. Regulation of zinc metabolism and genomic outcomes. *J Nutr* 133: 1521S – 1526S.
26. **Cao J**, Henry PR, Davis SR, Cousins RJ, Miles RD, Littell RC, Ammerman CB. 2002. Relative bioavailability of organic zinc sources based on tissue zinc and metallothionein in chicks fed conventional dietary zinc concentrations. *Anim Feed Sci Technol* 101: 161 – 170.
27. Halloran BP, Uden P, Duh QY, Kikuchi S, Wieder T, **Cao J**, Clark O. 2002. Parathyroid gland volume increases with postmaturational aging in the rat. *Am J Physiol Endocrinol Metab* 282:E557 – 63.
28. **Cao J**, Liuzzi JP, Bobo JA, Cousins RJ. 2001. Effects of intracellular zinc depletion on metallothionein and ZIP2 transporter expression and apoptosis. *J Leukoc Biol* 70:559 – 66.
29. Guo R, Henry PR, Holwerda RA, **Cao J**, Littell RC, Miles RD, Ammerman CB. 2001. Chemical characteristics and relative bioavailability of supplemental organic copper sources for poultry. *J Anim Sci* 79: 1132 – 1141.
30. **Cao J** Cousins RJ. 2000. Metallothionein mRNA in monocytes and peripheral blood mononuclear cells and in cells from dried blood spots increases after zinc supplementation of human. *J Nutr* 130: 2180 – 2187.
31. **Cao J**, Henry PR, Guo R, Holwerda RA, Toth JP, Littell RC, Miles RD, Ammerman CB. 2000. Chemical characteristics and relative bioavailability of supplemental organic zinc sources for poultry and ruminants. *J Anim Sci* 78: 2039 – 2054.
32. **Cao J**, Henry PR, Ammerman CB, Miles RD, Littell RC. 2000. Relative bioavailability of basic zinc sulfate and basic zinc chloride for chicks. *J Appl Poultry Res* 9: 513 – 517.

33. **Cao J**, Luo XG, Henry PR, Ammerman CB, Littell RC, Miles RD. 1996. Effect of dietary iron concentration, age, and length of iron feeding on feed intake and tissue iron concentration of broiler chicks for use as a bioassay of supplemental iron sources. *Poultry Sci* 75: 495 – 504.
34. **Cao J**, Chavez ER. 1995. Comparative trace mineral nutritional balance of first-litter gilts under two dietary levels of copper intake. *J Trace Elem Med Biol* 9: 102 – 11.
35. Gao XH, Yang FH, **Cao J**, Kim SD, Kim DZ, Zhang XW, Wu JX, Wang XW. 1995. The effects of protein and energy levels on growth performance of two-year old male Sika Deer. (*Cervus Nippon Temminck*) meat. *Special Wild Economic Animal and Plant Research* 3: 15 – 19.
36. **Cao J**, Chavez ER. 1995. The effects of low dietary copper intake during pregnancy on physiological fluids and reproductive performance of first-litter gilts. *J Trace Elem Med Biol* 9: 18 – 27.
37. **Cao J**, Jiang CS, Tong YR, Pan JR. 1991. The effects of dietary selenium levels on tissue selenium concentrations and fur quality of mink (*Neovison vison*). *Acta Zoonutrimenta Sinica* 2: 10 – 14.
38. Kim SD, Cheng YS, **Cao J**, Wei HJ, Wang YC. 1990. Analysis of Chemical Composition of Muskrat (*Ondatra zibethica L.*) meat. *J Fur Anim* 48: 15 – 17.

#### **Other publications:**

39. **Cao JJ**. 2011. Phytonutrients are good for bone health. Grand Forks Herald (Newspaper article).
40. **Cao JJ**. 2009. Women's Bone Health: Beyond Calcium and Vitamin D. Grand Forks Herald (Newspaper article).
41. **Cao JJ**. 2009. The Role of Protein in Bone Health. Grand Forks Herald (Newspaper article).
42. **Cao JJ**. 2008. Connecting the dots: from obesity to osteoporosis. Grand Forks Herald (Newspaper article).
43. **Cao JJ**. 2007. Build healthy bones with physical activity. Grand Forks Herald (Newspaper article).
44. **Cao JJ**. 1998. Characterization of organic zinc sources and their relative bioavailabilities for poultry and sheep. (*Ph.D. Dissertation, University of Florida, Gainesville, FL*).
45. **Cao JJ**. 1995. Copper nutrition in first-litter gilts. (*M.Sc. Thesis, McGill University, Canada*).
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