Expanded Objectives

1.Share and critique new techniques, experimental designs, and in progress/ recent unpublished data regarding adipocyte biology and animal metabolism through the personal-interactive process at the annual Project Committee meetings. The goals are to improve experimental designs, methodology and data interpretation of committee members’ work to insure high standards of science and research accomplishments. In addition, focus this work on US and global issues in lipid biology as the committee membership and ad hoc participants are both from national (US) and international institutions and organizations. The annual committee meeting is the principal activity for exchange and planning mechanisms of this NCCC committee.

2. Plan to increasingly implement newly emerging high through-put technologies and experimental methodologies to further refine our understanding of adipose tissue biology and its role in regulation of whole body metabolism in farm animals, animal models and humans. These emerging tools include high throughput genomics and transcriptomics, next-generation sequencing, SNP-genome wide association analyses, proteomics, co-culture of myocytes and adipocytes, epigenetics and gene silencing mechanisms.

3. Sponsor two symposia to be presented by members of the Project Committee. We plan to orient a symposium at Experiential Biology (EB) toward comparative lipid biology and adipose cell function including role of epigenetics, adipose as a cytokine source, tissue cross-talk on health and whole body lipid metabolism. For an American Society of Animal Science meeting a symposium will be targeted toward lipid metabolism in food animal species including regulation of intramuscular (intra-fascicular) fat deposition, regulation of adipocyte proliferation and differentiation in vivo, (particularly in lean tissues-around and between muscle fibers including interactions between adipocytes and myocytes) and adipocytes dedifferentiation as a source of stem cells. Final topics for symposia will be determined upon consultations with conference organizers.

4. Write at least one review from varying topics including lipid biology and obesity, impact of climate change on adipose deposition and growth of meat animals and putative role of adipocyte culture on stem cells production. The expertise of the committee here will serve a very necessary educational/broadening function for students and workers in the field.

5. Summarize preliminary results from particular common areas of work from a number of committee participants to develop and submit joint research projects. Members of the Project Committee plan to develop research proposal(s) for coordinated study in lipid biology with application to animal agriculture, human obesity, as well as appropriate in vitro models for use in clinical applications of tissue regeneration and reconstruction. The annual interaction by all members, as well as more frequent interactions of select members will enhance the opportunities for extramural funding shared between our institutions to further research and discovery in the biology of lipids, especially utilizing emerging research methodologies for adipose tissue in meat animals and humans.

6. For over 50 years, this NCCC committee (and its predecessors) has accrued an enviable record of achievement to animal agriculture, quality of muscle foods and lipid biology. To continue this tradition, NCCC210 will develop continued coordination of the Project Committee through planning based on outcomes of the current renewals lifetime.