

Thermal properties of eggplant as a factor for developing an appropriate crop processing system

EGGPLANT (*Solanum melongena*) has high export potential for the Philippines. Thus, the thermal properties of eggplant were studied to determine the appropriate design for heating or cooling/freezing equipment suited to handling and processing the crop specially for the export market.

Some of the important thermal properties include specific heat, bulk density, thermal conductivity, and thermal diffusivity. Specific heat was determined using a calorimeter by the method of mixtures. Bulk density was determined by weighing the contents of a known volume (0.000487 m³) while true density was computed using the volume of the cut eggplant samples. Thermal conductivity was measured using the modified Fitch method. These were studied at different levels of temperature, size, length of storage, and slice orientation.

The density of eggplant ranged from 390.5 to 927.7 kg/m³. True density increased with time but decreased after four days of storage, due to senescence. Bulk density ranged from 288.3 to 385.3 kg/m³. Bulk density increased only slightly with an increase in days of storage when cut longitudinally

rather than when cut transversely. Bulk density of eggplant decreased when they were stored at temperatures of 5° – 12°C, but increased at temperatures of 12° – 25°C. The calculated specific heat is 2.953 kJ/kg-K. This is not affected by size, temperature, or duration of storage. The thermal diffusivity values were significantly different for eggplants cut transversely (0.000142 m²/second), compared to those cut longitudinally (0.000103 m²/second). Thermal conductivity also differed significantly in eggplant cut transversely (0.1375 W/m-K) compared to those cut longitudinally (0.0998 W/m-K). These values should be considered in designing an appropriate storage and processing system for eggplant.

News source: **The Philippine Council for Agriculture, Forestry and Natural Resources Research and Development.**

For further information, Aguila F.T., E.K. Peralta, Thermal properties of eggplant (*Solanum melongena*). *Highlights 2001*, PCARRD, Los Banos, Laguna 2002, pp. 66-67.

Acupuncture analgesia in water buffaloes

THE HIGH COST of veterinary medicines and biologicals prevents small-scale water buffalo raisers from using these during surgical procedures, or to treat various diseases and disorders. This results in reduced production and reproduction efficiency. An alternative procedure, acupuncture analgesia, was studied to find out if this would produce analgesia during surgical procedures and hasten recovery of water buffaloes from surgical procedures such as castration and rumenostomy. We also studied the usefulness of acupuncture in treating reproductive disorders, specifically post-partum infertility in water buffaloes.

Results revealed that electroacupuncture using three acupuncture point (acupoint) combinations located along the vertebral column and under the tail base induced analgesia in different parts of the body.

Specifically, the three acupoints used were the following: 1) Acupoints #31 and #26; 2) Acupoints #31 and #47; and 3) Acupoints #31 and #52. Induction of electroacupuncture analgesia varied from eight to twenty-five minutes, following the stimulation of particular acupoints.

Electroacupuncture analgesia can be used in place of conventional anesthesia when inhibiting the fertility of male buffaloes by vasocclusion. The effects of local anesthesia and electroacupuncture analgesia were similar in terms of healing rate. Results also showed that electroacupuncture analgesia can be used in place of lidocaine for rumenostomy.

Acupuncture with a hypodermic needle has the potential to be used as an alternative method to treat postpartum anestrus in water buffaloes. Acupuncture induced a shorter interval from calving to first heat,

calving to first corpus luteum development, first follicular development to first heat, and first follicular development to first corpus luteum development.

These results were obtained under controlled conditions. It is recommended that acupuncture to induce analgesia for therapeutic procedures be tested under actual field conditions.

News source: **The Philippine Council for Agriculture, Forestry and Natural Resources Research and Development**

For further information: Acorda, J.A., et al., Application of acupuncture analgesia and therapy in water buffaloes. *Highlights 2000*, PCARRD, Los Banos, Laguna 2001, pp. 179-182.

In vitro buffalo embryo production

TECHNOLOGY for *in vitro* (outside the animal body) embryo production (IVEP) involves techniques of *in vitro* oocyte maturation and *in vitro* fertilization (IVM/IVF). Immature buffalo oocytes are aspirated from 2 to 8 mm surface follicles of slaughtered animals, using a 18 G needle attached to a 10 ml disposable plastic syringe containing 3% Fetal Bovine Serum in Phosphate Buffered Saline. The selected oocytes are allowed to mature in a culture medium (e.g., TCM-199).

After 23 - 24 hours of *in vitro* maturation, mature oocytes are fertilized *in vitro* using frozen-thawed semen. Fertilized oocytes are further cultured in the maturation medium until the embryos reach the morula, early blastocyst or expanded blastocyst stages. At these stages, good quality embryos are ready for transfer to recipient female water buffaloes.

The IVEP makes possible the use of animal genetic resources from abroad in countries which lack highly productive breeds. For instance, salvaged superior genetic materials from India may be used through IVEP by other countries. This eliminates wastage of this important resource, reduces the risk of disease

transmission, and avoids the high cost of importing live animals.

The viability of the technique has been proven by a confirmed pregnancy rate of 14.7% among recipient animals. The highest rate of pregnancy was 25%, achieved with embryos vitrified and transferred at the early blastocyst stage, while 18.75% was achieved at the expanded blastocyst stage, and 14.29% was achieved at the morula stage. Embryo age, and recipient post-estrus synchrony suggested a \pm one day safety timing for embryo transfer. Continuous refinement of the technique is still in progress to improve efficiency.

News source: **The Philippine Council for Agriculture, Forestry and Natural Resources Research and Development**

For further information, Duran, D.H., et al. Pregnancies from *in vitro* produced and vitrified buffalo embryos after embryo transfer. *Highlights 2001*, PCARRD, Los Banos, Laguna 2002, pp. 155-156.

Effects of harvesting age and felling cycle on shoot or culm production of bamboo

THREE BAMBOO species (*Bambusa vulgaris*, *Bambusa blumeana*, and *Bambusa blumeana* var. *luzonensis*) were tested for their regeneration or reproduction capacity. Specifically, the study tried to find out the effects of age and felling cycles on the reproduction of shoots or culms in bamboo. The experiment used the Randomized Complete Block Design (RCBD) with three replicates.

Results of the study showed that *B. vulgaris* and *B. blumeana* var. *luzonensis* reproduced more culms if three-year old culms were harvested each year. In contrast, *B. blumeana* reproduced more culms if three-year old culms were harvested at two-yearly intervals.

However, for *B. blumeana*, yearly harvesting of three-year old or older culms resulted in more surviving shoots or fewer dead shoots compared to harvesting cycles. For *B. vulgaris*, yearly harvesting of culms

lessened the number of dead shoots or there were more regenerations, consequently, a greater number of culms were harvested.

In terms of culm diameter, it was found out that annual harvesting produced bigger bamboo shoots or culms among the three species tested.

News source: **The Philippine Council for Agriculture, Forestry and Natural Resources Research and Development**

For further information, Decipulo, M.S., L.E. Tiongco, L.D. Agne. Effect of harvesting age and felling cycle on shoot and culm production of *Bambusa blumeana*, *B. vulgaris*, and *B. blumeana* var. *luzonensis*. *Highlights 2001*, PCARRD, Los Banos, Laguna 2002, 209 pp.