

**LATE**

STATE OF HAWAII  
**AGRIBUSINESS DEVELOPMENT CORPORATION**  
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TESTIMONY OF JAMES J. NAKATANI  
EXECUTIVE DIRECTOR  
AGRIBUSINESS DEVELOPMENT CORPORATION

BEFORE THE HOUSE  
COMMITTEE ON  
FINANCE

Monday, February 25, 2013  
1:30 p.m.  
Conference Room 308

HOUSE BILL NO. 1409, HD 1  
RELATING TO BIOFUELS

Chairperson Luke and Members of the Committee:

Thank you for the opportunity to testify on House Bill No. 1409, HD 1 relating to bio-fuels. The purpose of this measure is to allocate unspecified amount of every 15 cents of the barrel tax deposited into the energy security special fund and unspecified cents of every 15 cents of the barrel tax deposited into the agricultural development and food security special fund as investment capital for zero waste bio-fuel production projects (see attached). The Agribusiness Development Corporation (ADC) supports the intent of this bill.

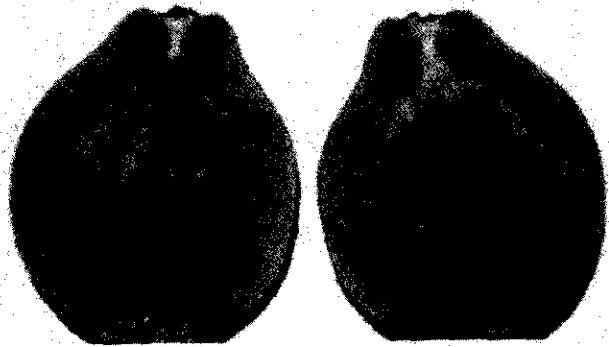
ADC strongly supports the Zero Waste Bio Fuel Project. However, we suggest that other avenues of funding should also be looked into to ensure the success of this program. Both DBEDT and HDOA have proposed initiatives on how to spend barrel tax funds and ADC would not want to jeopardize those programs/priorities. The committee should, perhaps, consider CIP or general funds for this project.

We have observed the progress of this project from its inception 2 years ago and there is little doubt that this Zero Waste Bio-fuel Project has the potential to be a game changer and will enhance our State's food and energy security. In fact, HDOA recently committed \$200,000 using barrel tax funds to this project which will be used to move this project closer to the commercialization stage. Converting organic waste such as rejected off grade agricultural produce into oil and high protein feed provides tremendous opportunity for farmers to generate additional revenues from their crops, provide cattlemen an alternative source for high protein food, lower Hawaii's dependence on the importation of fossil fuel and if proven successful, provide the state with investment income for the long term.

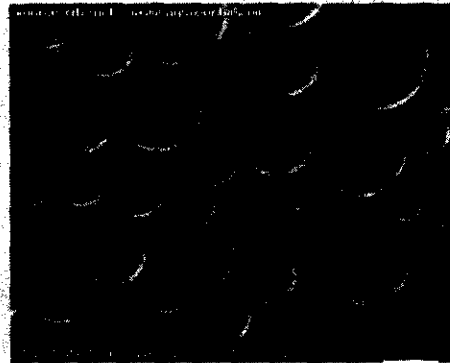
One of ADC's initiatives is to help revitalize the Papaya industry which has been on the decline for years. Currently, there are very few options for papaya farmers when it comes to organic waste and rejected off grade papayas. Rather than disposing the papayas, which are not marketable, the papayas could be converted into bio-fuels as well protein feeds. And this could be just the beginning as other research can assist in converting other agricultural waste products such as sugar cane, mango and even albizia into valuable commodities such as oil and high protein feed.

Thank you for the opportunity to provide testimony on this measure.

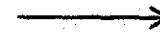
# Zero Waste Concept: Making Something out of Nothing



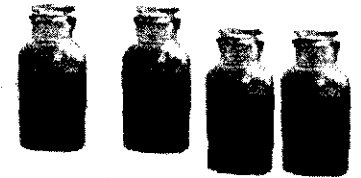
Waste papaya



Grow Algae on Papaya



Harvest Algae



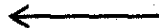
Algal Oil



Biofuel



Algae Meal



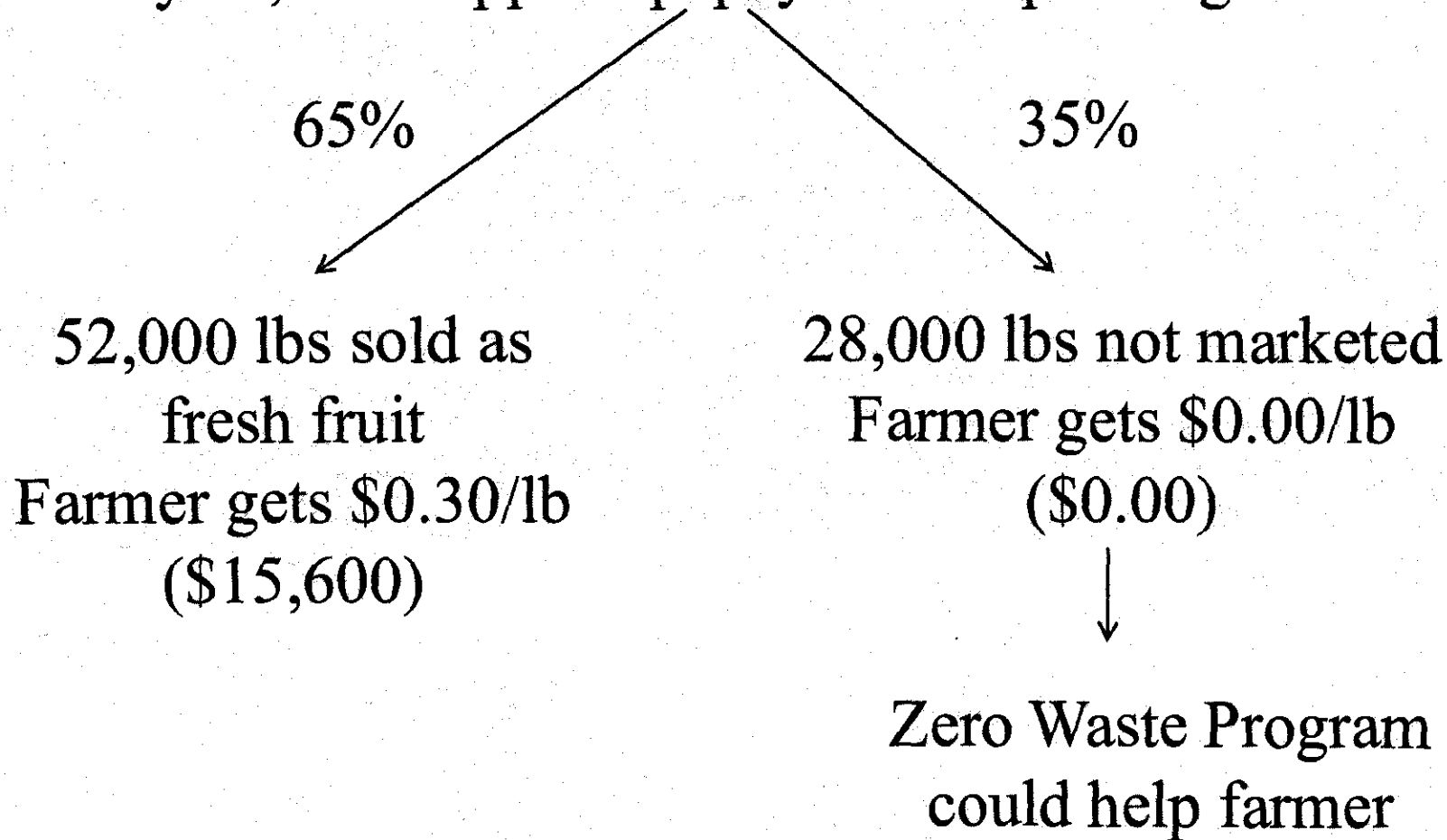
Animal Feed

1999: Commercial Planting



# Papaya farmers losses due to culls

Example: Farmers harvests 80,000 lbs/acre in a year, and supplies papaya to the packinghouse



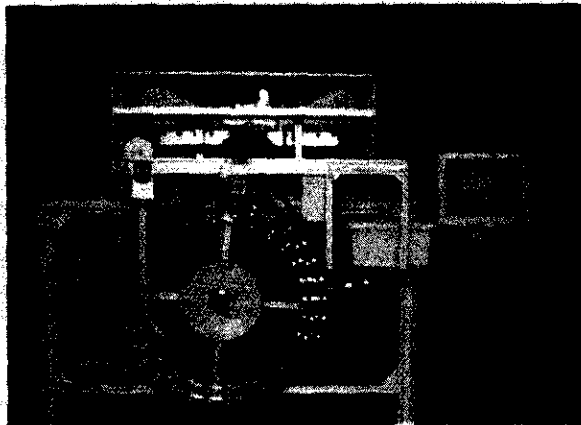
# Zero Waste Components

1. Select agriculture or other waste (ex: papaya culls)
2. Select oil producing algae or fungi that can use papaya as a food (carbon) source
3. Optimize growth conditions
4. Grow algae or fungi on papaya in closed containers
5. Harvest algae or fungi
6. Extract oil and meal from harvested algae

# Key Components of Program

\*Adapt algae to use papaya as carbon source

Collaboration with BioTork



Machine to  
adapt algae



Alberto and Crecy



BioTork  
Scientists

# Key Components of Program

\*Optimize condition for algae production

Work done at PBARC



Lisa Keith  
leads research



PBARC  
group



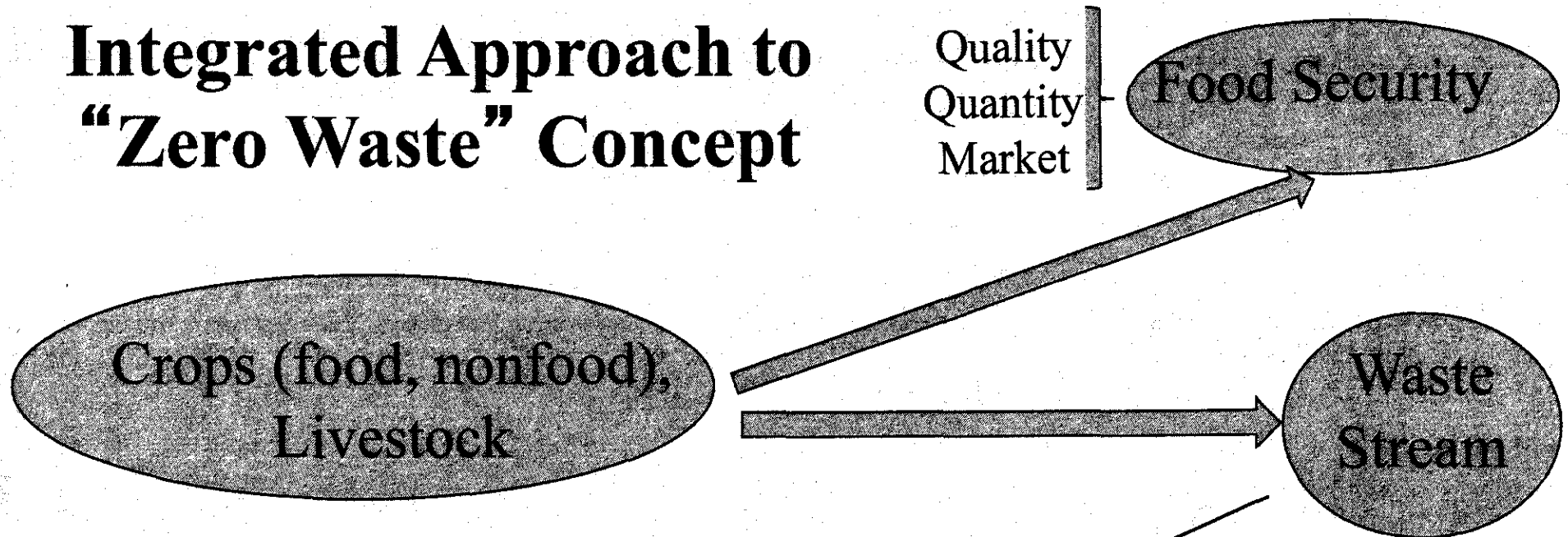
# Reached Economic Level of Oil and Meal production from Papaya Culls

- 1 lb papaya = 454 grams, 90% is water
- Solids = 45 grams
- We convert 66% of solids to oil and meal
- Get 15 grams oil and 15 grams meal from 1lb of fresh papaya cull
- 15 million pounds of papaya waste yield:
  - 500,000 lb oil and 500,000 lb meal

# Zero Waste as a Business

1. Select agriculture or other waste (ex: papaya culls)
2. Select oil producing algae or fungi that can use papaya as a food (carbon) source
3. Grow algae or fungi on papaya in closed containers
4. Harvest algae or fungi
5. Extract oil and meal from harvested algae
6. Algal oil and algae are business products

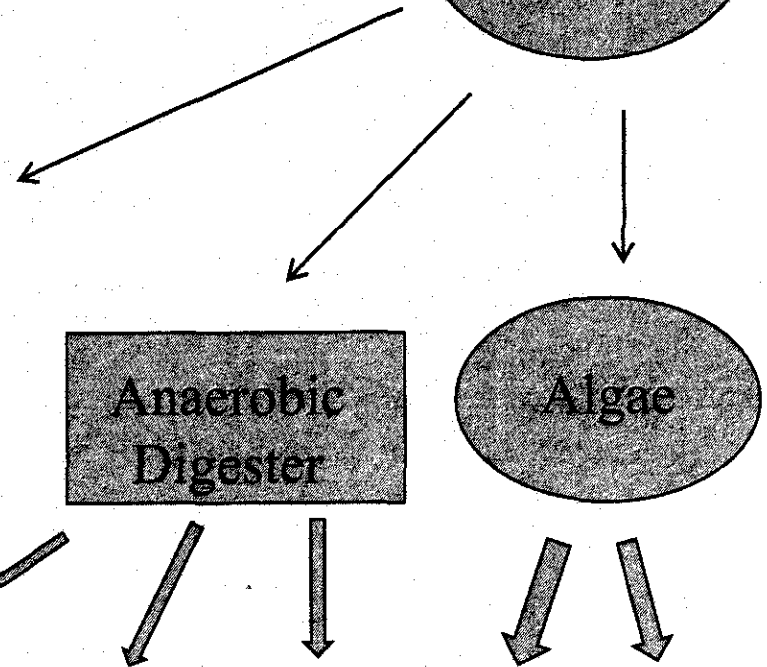
# Integrated Approach to "Zero Waste" Concept



## Potential Benefits

- Profitable Agriculture
- Development of stable markets
- More jobs in community
- New businesses

Other Value Added Products



Chips, fertilizers, biofuel, feed, etc.

Biofuel

Bio-Fiber

Fertilizer

Feed Biofuel