FUEL GAS PRODUCTION
FROM ANIMAL WASTE

Phase I

Quarterly Progress Report (2nd) for the
Period September 1, 1976 - December 1, 1976

Dynatech Project No. ERD-2
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ABSTRACT

During this second quarter, meetings were held with contractors on the ERDA Fuel Gas from Animal Waste Program to discuss project planning and review. Site visits were made to groups involved in anaerobic digestion.

An engineering and economic analysis of a process for the anaerobic digestion of animal residue has been completed and the results can be used for the design of a pilot plant unit. A comprehensive engineering report of this analysis has been completed and a first draft was submitted to ERDA.

Several proposals were received from ERDA and reviewed.

STATEMENT OF OBJECTIVES

The work reported here was undertaken to provide professional evaluation and coordination of ERDA supported programs in the area of fuel gas generation from animal wastes via anaerobic fermentation.

A second objective is the analysis of a process for production of fuel gas by anaerobic digestion of animal wastes. A report of this analysis is to be used by ERDA as part of an RFP for the design, construction, and operation of a pilot plant facility.

A third objective is the review of proposals submitted to ERDA in the field of fuel production by anaerobic digestion.

DESCRIPTION OF TECHNICAL PROGRESS

Work Accomplished:

A. Coordination and Evaluation

Meetings were held with the various ERDA contractors in the Fuel Gas from Animal Waste Program to review and plan the work and visit and inspect the various facilities (Appendix A). A quarterly coordination meeting was held in September at Greeley, Colorado.

B. Engineering Design and Analysis

The technical and economic analysis of the anerobic digestion process for fuel gas from animal residue was carried out. The equations for system performance and economics were formulated and a computer program was developed with these equations plus a routine to optimize to minimum unit gas cost. The results indicate that an economically acceptable fuel gas could be produced, i.e., \$1.50/MCF for a 40,000 head environmental feedlot with a refeed potential for digester effluent (Figure 1). A first draft comprehensive engineering report of this analysis has been completed and submitted to ERDA.

C. Review of Proposals

Proposals submitted to ERDA in the field of fuel gas production via anaerobic digestion were reviewed by Dynatech and recommendations as to action on these proposals were submitted to ERDA. A listing of proposals received and reviewed is presented in Appendix B.

Figure 1. Feedlot Size (No. of Head)

Work Forecast:

A. Coordination and Evaluation

A two-day quarterly review meeting will be held on December 13-14 at Stanford University with the contractors on the ERDA Fuel Gas from Animal Waste Program. Additional meetings and site visits will be conducted when necessary.

B. Engineering Design and Analysis

The comprehensive engineering report on this phase of the program will be prepared in final form and any necessary additional work will be carried out.

C. Proposal Review

Dynatech will continue to assist ERDA in the review and evaluation of proposals submitted to ERDA in the field of fuel gas from animal waste.

APPENDIX A

The following is a list of meetings held under the ERDA fuel gas from animal waste contractors

Date	Location	Person Contracted	Dynatech Representative	Purpose
September 1976	Greeley, Colorado	ERDA Contractors	R.L. Wentworth D.L. Wise	Quarterly Coordination Review Meeting
October 12, 1976	Cambridge, Mass.	Warren Coe, Dan Lizdas, Hamilton-Standard (ERDA Contractor)	R.L. Wentworth D.L. Wise E. Ashare R.G. Kispert	Review Hamilton-Standard work & to obtain practical input for engineering analysis
October 26, 1976	Ithaca, N.Y.	W. Jewell, Cornell Univ. (ERDA Contractor)	R.L. Wentworth E. Ashare	Review work being done at Cornell Univ.
November 17, 1976	Bartow, Florida	Don Kaplan, Pres. Kaplan Industries, Inc.	D.L. Wise	Visit environmental feedlot practicing animal residue refeed
November 18, 1976	Miami, Florida	U.S.-Japan Solar Energy Conference Univ. of Miami	D.L. Wise	Participate in Conference
November 19, 1976	Gainesville, Fla.	Prof. Paul H. Smith Head, Dept. of Microbiology, Univ. of Florida	D.L. Wise	Discuss Enhancement of animal residue refeed by anaerobic digestion
November 30, 1976	Urbana, Illinois	J. Pfeffer Univ. of Illinois	R.L. Wentworth E. Ashare	Review work being done at Univ. of Illinois

APPENDIX B

The following proposals received from ERDA were reviewed

Proposal Number	Institution	Investigator	Title	Date
P-7603088	Mitre Corporation Matrek Division	Dr. Martin Scholl	Proposal for Structuring Silviculture Plantations Development	8/76
U-7606027	Woodshole Oceanographic Institution	Joel C. Goldman		8/22/76
	Sunny Times Foods, Inc.	Courtney P. Allen		10/15/76
U-7606323	University of Illinois	James Stukel	Proposed Bioconversion Workshops	10/15/76

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