Animal wastes media for *Spirulina* production

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With 1 figure and 3 tables in the text

**Abstract:** *Spirulina maxima* is a well known blue-green microalga (cyanobacteria) with a high protein content (57 to 64% d. w.). It harvesting is rather easy. In order to perform an intensive culture, liquors effluents from animal wastes, (manure and urine of pig, beef cattle and sheep) anaerobic biodigestion were utilized. The effect of nutrient concentrations on growth and biomass yield, and nitrogen efficiency conversion were studied. Under environmental light, and room-temperature conditions, a dry biomass ranging between 795 and 1230 mg l⁻¹ was yielded. In the synthetic medium, the nitrogen efficiency conversion was 24 to 27%, and about 65% in animal-waste media. *Spirulina* might be therefore used as an effective photosynthetic agent for nutrient recovery from animal wastes.

Key words: Algae, *Spirulina*, animal waste, yield, nitrogen conversion, biodigestion, culture medium, mass culture.

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**Introduction**

During the recent decades, production and use of microalgae biomass are being performed in many countries (Stengel 1970, Oswald 1978, Becker 1981). Mass production of microalgae should be of great importance in arid and semiarid zones where traditional agriculture is limited by adverse climatic conditions (Dubinsky et al. 1978, Durand-Chastel 1980, Vonshak et al. 1982). Appropriate technologies and processing of cultures have been developed (Benemann et al. 1977, Mohn 1978, Ogawa & Aiba 1978). Hence, the microalgae utilization as nutrient recovery agent from animal wastes, has been described as one of the promising uses of these microorganisms (Lincoln & Hill 1980, Pieterse et al. 1982).

*Spirulina* appears to be one of the most studied blue-green algae as a future protein resource. It has a high protein content (57 to 64% dry matter), an excellent amino acid pattern, high pigment content especially carotenoids, good digestibility, and absence of toxic compounds (Jaquet 1974, Clement et al. 1975); it is