CORRESPONDENCE

MORE ABOUT DAMON'S PRE-PUBLIC INVESTMENT IN DAMON BIOTECH

To the editor:

Dr. James Murray's response to Damon Corporation's vice president of public information, Marcia A. Kean (BIO/TECHNOLOGY **2**:733, 1984), leaves me wondering whether his scholarly distinction between Damon Biotech and *de novo* biotech companies is unnecessary hair splitting. Was not every company "a gleam in someone's eye long before the accountants had to carefully attribute its pennies—especially in regard to good old overhead?" I know ours was.

We can all guess at the value of the time of senior scientists, managers, venture capitalists, lawyers et al, who have devoted pre-accountant attention to making real the biotech gleam in their eyes. Damon Biotech is not different from other biotech start-ups just because its creators chose to make it a subsidiary of Damon Corp.

We need Dr. Murray's halls of scholarship for too much important advice to begin making such fine distinctions in the industry press.

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THE DANGERS OF NITRO COMPOUNDS

To the editor:

In their article (BIO/TECHNOLOGY **2**:805, 1984) entitled "Chemical and Bacterial Pretreatment of Lignocellulosic Material to Increase Ruminant Digestibility," Drs. Kerr, Windham, and Benner report that pretreatment with nitric acid is the method of choice for increasing ruminant digestibility of peanut hulls, when followed by *Arthrobacter* sp. strain KB-1 degradation. The authors are thus currently utilizing this methodology for the production of experimental cattle feed on a pilot plant scale.

There is, however, reason to exercise caution when contemplating the introduction of substantial concentrations of nitrate into animal or human foodstuff. One should first consider that nitric acid may react with organic materials to form potentially toxic nitro compounds. Secondly, inorganic nitrate is readily reduced to nitrite by several species of common gastrointestinal bacteria. Nitrite plus organic amines can then go on to form highly carcinogenic N-nitrosamines (see J. Sander, *Hoppe-Seyler's Z. Physiol. Chem.* **349**:429–432, 1968.) These reactions are also known to occur during handling and storage of food products containing inorganic nitrate (see T. Fazio et al, *J. Agr. Food Chem.* **19**:250–253, 1971, and Y. Y. Fong and W. C. Chan, *Nature* **243**:421–422, 1973). Moreover, appreciable N-nitrosamine formation by gut flora has been demonstrated where the *in vitro* concentration of nitrate is about two orders of magnitude below that proposed for the nitric acid pretreatment in the cattle feed pilot plant (see Sander). It is thus reasonable to suspect that even three thorough water rinses would leave potentially hazardous concentrations of nitrate in the livestock feed.

In light of recent experience involving the use of nitrate as a preservative in smoked foods, it would be prudent to rule out the formation of carcinogens at the pilot plant stage.

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We would like to state the following in reply to Dr. Brind's letter concerning the possibility of passing on carcinogenic nitro-compounds to consumers of beef or milk from cattle that have been fed peanut hulls treated with nitric acid and the bacterium Arthrobacter *sp. KB-1.*

After the hulls are treated with the nitric acid, they are thoroughly washed with water until the pH is neutral. This removes all of the liquid nitric acid residues and other soluble nitrogenous compounds.

There are several possible fates for the remaining nitrogen-containing compounds in the hulls. During aerobic bioconversion by KB-1, some portion of the nitrogen-containing compounds in the treated hulls is used for the production of bacterial protein and biomass. The nitrogen-containing compounds remaining in the hulls after aerobic incubation with KB-1 are then subjected to biodegradation by rumen microorganisms. Rumen microorganisms are capable of utilizing a wide variety of nitrogen-containing compounds—including organic and inorganic forms—for the production of microbial protein and biomass.

To our knowledge, there are no published reports of the production of carcinogenic, nitrogen-containing compounds by rumen microorganisms, even though a wide variety of nitrogen-containing compounds have been fed to cattle. Therefore, we feel there is no existing evidence to suggest the formation of carcinogenic agents from peanut hulls treated as described in our article.

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REPORTS OF ITS DEATH WERE EXAGGERATED

To the editor:

I am writing in reference to your article entitled "Phillips: Wildcatting in Biotech" (BIO/TECHNOLOGY **2**:853, 1984). The article implied that the Bartlesville Energy Technology Center (BETC), including its capabilities in microbial enhanced oil recovery, is now defunct. I would like to set the record straight. BETC is currently being operated by IIT Research Institute of Chicago under a five-year cooperative agreement with the Department of Energy. The facility has been renamed the National Institute for Petroleum and Energy Research (NIPER). This action was taken specifically to maintain the research capabilities at this laboratory.

Since the changeover in operation a year ago, about 90 new staff members have been hired, and the research operations have been expanded. We are currently researching petroleum and gas production—including microbial enhanced oil recovery—petroleum processing and utilization, and alternate fuels.

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