

# The PAG Bulletin— A Publication of the United Nations Protein Advisory Group

The FAO/WHO/UNICEF Protein Advisory Group (PAG) advises the United Nations agencies on many aspects of protein food activities. In the past it has been especially active in the field of protein-rich food mixtures: their manufacture, marketing and nutritional value. With the increased interest on the part of the various U.N. agencies in world protein problems, the PAG has recently expanded its activities. Much of the Group's work is described in the bi-annual *PAG Bulletin*. Scientists, industrialists and other specialists interested in receiving this Bulletin, which is sent without charge, should address their requests to the PAG Secretariat, United Nations, New York, New York 10017 U.S.A.

## New NBS-NIH Method Improves Fourier Transform NMR

A new NMR method (Becker, Ferretti and Farrar, to be published) cooperatively developed by scientists at the National Bureau of Standards (Department of Commerce) and the National Institutes of Health (Department of Health, Education and Welfare) reduces the time required to obtain some spectra from as much as 100 hr to several minutes. T. C. Farrar (NBS), E. D. Becker (NIH), and J. A. Ferretti (NIH) have demonstrated that the equilibrium magnetization of nuclei with long spin-lattice relaxation times may be restored rapidly. Called "driven equilibrium Fourier transform," DEFT, their method takes full advantage of Fourier transform spectroscopy, a technique that has significantly improved the signal-to-noise ratio of high resolution NMR spectra.

The Fourier transform experiment consists of applying a radiofrequency pulse to a sample, measuring as a function of time the free induction signal resulting from the nuclear spins in the sample, and performing a Fourier transformation on the signal to provide a high resolution spectrum. However, application of this technique to nuclei with long spin-lattice relaxation times ( $T_1$ ) has been hampered by the fact that these nuclei do not quickly return to equilibrium magnetization after a pulse is applied, and a second pulse cannot be applied until magnetization is restored. Therefore, accumulation of spectral information is limited to that short interval of time when the nuclei are in equilibrium magnetization and before the free induction signal attenuates.

The DEFT method, on the other hand, permits rapid pulse rates by forcing the nuclei back to equilibrium magnetization with virtually no attenuation of the signal. A  $180^\circ$  refocussing pulse is applied at time  $\tau$  immediately after decay of the initial signal. Because decay of the signal due to field inhomogeneity is largely reversible, at time  $2\tau$  the refocussing causes an "echo," two signals back to back. In the DEFT method, precisely at the peak of echo when the nuclei are again in phase, a  $90^\circ$  pulse is applied restoring magnetization. Exactly how much the NMR signal is enhanced depends upon  $T_1$ , the spin-spin relaxation time ( $T_2$ ), and the effect of diffusion in a magnetic field gradient.

DEFT NMR promises to be a powerful technique in enhancing signals for many nuclei of spin  $\frac{1}{2}$  that have long  $T_1$  and  $T_2$ , low sensitivity, and in some cases occur at low natural abundance. In addition to the  $^{13}\text{C}$  nuclei being studied by the NBS-NIH scientists to learn more about biological molecular structures, suitable nuclei include  $^{15}\text{N}$ ,  $^{57}\text{Fe}$  in diamagnetic compounds,  $^{31}\text{P}$ , and  $^{183}\text{W}$ .

## AOCS HONORED STUDENT PROGRAM CALL FOR NOMINATIONS

R. T. Holman, Chairman of the AOCS Honored Student Award Program, has issued a call for nomination of outstanding graduate students in the field of Fats, Oils and Lipids.

The Honored Student Program was established in 1963 under the direction of the AOCS Education Committee. The Program awards to selected students an all-expense paid trip to attend AOCS National Meetings.

Several awards will be conferred in 1970 and all will be made for attendance at the ISF-AOCS World Congress which will be held in Chicago, September 27-October 1, 1970. Foreign students will be nominated by their respective national organizations and need not apply directly.

Professors are urged to nominate the most promising students. Nominations are to be submitted before March 1, 1970. Forms are available upon request from R. T. Holman, The Hormel Institute, 801 16th Ave. N.E., Austin, Minnesota 55912.

## ITERG Days of Information on Toilet Soap

Among soap and personal hygiene products, toilet soaps have had a phenomenal development of their market during the last few years. And their future looks equally promising. This is partly the result of an improved standard of living, which has caused customers to demand better products. It is also the result of scientific progress and improved manufacturing techniques. Consequently the soap industry furnishes an attractive and diversified gamut of toilet soaps which have gained increased consumer acceptance.

It was considered to be of great interest to analyze the reasons for this situation from a technical viewpoint. Therefore the Administrative Council of ITERG, in conjunction with the Association of Soaps, Detergents and Personal Products, has decided to devote its 1970 Days of Information to toilet soaps.

These Days will take place in Paris on June 16-19, 1970, under the chairmanship of Mr. Cornu, President of the aforementioned Association.

An organizing committee, headed by Mr. Bergeron of Colgate-Palmolive, has been working on the program, which promises to be not only of interest but to provide answers to all technical problems as well.

Some of the lectures will be on the following subjects: animal fats and fatty acids and their basic processing; the shortcomings to toilet soaps; analytic control of their properties; their properties; their structure; their purity; pharmaceutical soaps, bar detergents and mixed toiletry products.

The marketing of toilet soaps will also be dealt with. However the major part of the conference will be devoted to round table discussions. The first, concerning the technology of toilet soaps, will enable the principal manufacturers of soap making equipment to describe their latest advances. The second will concern additives for toilet soaps, specifically perfumes, coloring agents, deodorants, etc.

Anyone desiring more information please write to: L'Institut des Corps Gras, 5 Boulevard de Latour-Maubourg, 75 Paris (8), France.