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THE DIRECTOR'S DIGEST"

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COLLAGEN DERIVATIVES

One of the major problems of the rendering industry is to improve the value of the collagen that comprises at least 40% of the protein we produce. For the past two and one-half years FPRF has supported research at The Gelatine and Glue Research Association, Birmingham, England with emphasis on the development of collagen derivatives that might find widespread industrial use. The following summary of results from The Gelatine and Glue Research Association indicates several areas where promising findings have been obtained.

Microencapsulation. In the original studies involving the use of gelatin for microencapsulation (covered by National Cash Register patents) it was found that only acid process pigskin gelatin combined with gum arabic gave satisfactory results. Research at The Gelatine and Glue Research Association showed that chemical derivatives of cheaper gelatins (lime process hide gelatin) without gum arabic could be used. Recent studies have shown that larger capsules (known as "mini" capsules - about 300-1,000 microns in diameter) can be prepared using either the NCR preparation or benzenesulfonyl gelatin. To improve the mechanical stability of these larger capsules, researchers at GGRA found that a second coat of benzenesulfonyl gelatin could be applied after "reaction" of the capsule with lecithin. In other studies on techniques for drying it was found that the use of cellulose powder was a dispersing agent gave best results.

Cross-Linked Gelatin as a Flocculating Agent. Cross-linked insoluble (but dispersible) gelatins were prepared using cyanuric

chloride or glutaraldehyde as cross linking agents. A 1% solution of the cyanuric chloride cross-linked gelatin was shown to be very effective as a flocculating agent for suspension of quartz, uranium ore, coal washings or asbestos. In all cases the gelatin derivative performed as well or better than a commercial polyelectrolyte preparation.

Cross-Linked Gelatin for Rubber-Like Compositions. Visco-elastic gelatin was prepared with cyanuric chloride as the cross-linking agent but with a higher degree of cross-linking than in the case of flocculating agents. This material when blended with a water dispersion paint produced a stable, thixotropic, non-drip paint that gave a harder, stronger, more flexible film than was true for paint that did not contain the modified gelatin. These promising results are being followed up through cooperative tests with a large paint manufacturer. In addition of course it is likely that these visco-elastic gels may have other industrial applications in coatings, printers ink, etc.

Alkali-Modified Collagen for Beer Clarification. It has been found that the structure of collagen can be slightly modified by appropriate treatment with strong alkali to produce an acid soluble form of collagen called "eucollagen". These eucollagen preparations were tested as beer clarifiers in the GGRA laboratories and found to be very effective. Recently large scale trials were made in two breweries on different types of beer and ale. A mixture of bone eucollagen and hide eucollagen was found to be an excellent clarifying agent for beer and ale. Results with this material were equal or superior to those obtained with isinglass, the fining agent commonly used in England for beer clarification. The potential for eucollagen as a beer clarifying agent in the United States is now being investigated.

It is clear from the results reported above that collagen can be modified to yield materials that are applicable for widespread industrial use. This research, along with research to improve the nutritive value of collagen will certainly lead to the more effective utilization of our collagen protein with consequent improvement in the value of this material and a greater return to the rendering industry.

FAT FOR CEMENT COMPOSITIONS

The Proceedings from the "International Information Day on Tallow and Derivatives" held in Milan, Italy on June 21, 1967 have been published by the European Office of NRA and the Italian Society for the Study of Fats. A reprint "Fat Derived Materials for Cement Compositions" from these Proceedings is enclosed. (Because of the limited supply of reprints, you may not receive this).