Y E A S T S

A News Letter For Persons Interested In Yeast

November, 1956 Volume V, Number 2

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The Editor takes pleasure in thanking all those who have contributed to this issue. Without this gratifying support the News Letter cannot fulfill its purpose. The Editors would like to invite others to send in contributions for future issues. It is planned to publish the next issue of the News Letter in May, 1957. It would be appreciated if anyone would notify the Editor of additional people in our field who would like to receive the Yeast News Letter.

Cost of operation: The mimeographing and mailing of the present issue has used up the funds on hand. It would be appreciated if those who are able to would contribute $0.50 to help finance the two letters planned for 1957. Those who contributed in excess of this amount during the year and foreign readers who have difficulties transferring money are of course exempt.

The Editors.

I. South African Council for Scientific and Industrial Research, National Chemical Research Laboratory, P. O. Box 395, Pretoria, South Africa. Communicated by Dr. J. P. van der Walt.

A preliminary account is given of several new species of yeast which were isolated from soil. The detailed descriptions will be appearing in print in the near future.

Hansenula beijerinckii n.sp.

The species ferments glucose, saccharose and raffinose 1/3 and also assimilates maltose and galactose. It forms 1 - 4 saturn-shaped ascospores per ascus.

Hanseniaspora vineae n.sp.

This species ferments only glucose and assimilates only glucose (of the sugars used in the Delft system). Its cells, however, are considerably bigger than those of either Hanseniaspora valbyensis or Hanseniaspora uvarum. It forms 1 or exceptionally 2 warty spores per ascus.

Pichia terricola n.sp.

This large-celled species ferments only glucose and assimilates only this sugar (of the sugars used in the Delft system). However, it was also found that this species, like P. silvicola, was unable to assimilate xylose. Unlike P. silvicola it assimilates citrate. The strain forms an early pellicle and 1 - 4 round spores per ascus.

Saccharomyces lodderi n.sp.

This species, forming 1 - 4 oval to elongated spores which are rapidly liberated from the ascus after reaching maturity, will most probably eventually be transferred to the genus Dekkeromyces. It ferments glucose, galactose, saccharose and raffinose 1/3 but does not assimilate maltose or lactose. The species differs from S. phaselosporus (see Mycologia 47, 799, 1955), amongst others, in its production of a pseudomycelium, in its cell size and by the fact that trehalose is assimilated and fermented and sorbose and sorbitol are not assimilated.

Saccharomyces tellustris n.sp.

This large-celled species ferments only glucose and assimilates no other sugar of the Delft system. It forms no pseudomycelium and usually 1, very seldom 2, large round spores per ascus. The strain has a very weak ability to split arbutin.

II. Soil Bureau Experimental Station, Department of Scientific and Industrial Research, Eastern Hutt Road, Lower Hutt, New Zealand. Communicated by Dr. Margaret di Menna.

A new non-fermenting species of Candida has been isolated from the litter layer of a sphagnum peat bog. It is proposed to name it Candida muscorum and its characteristics are as follows:

Cells oval to long oval. Growth on solid media cream, fluid. Pseudomycelium strongly or weakly developed, not characteristic in appearance. Assimilation of glucose, sucrose, maltose, lactose (weak), galactose (weak). Potassium nitrate assimilated. Starch not synthesized. Growth factors not needed in basal synthetic medium. A description is being prepared for publication.

An account of a search for Cryptococcus neoformans in raw milk will appear in a forthcoming issue of Antonie van Leeuwenhoek, and a paper on the isolation of yeasts from soil is to be read at a meeting of the Australian and New Zealand Association for the Advancement of Science at Dunedin in January.

Note: Another paper (review) dealing in part with soil yeasts has appeared recently in Wallerstein Laboratory Communications 19, 221, 1956. "Yeasts in nature" by Aage Lund. The Editor

III. Departamento de Micologia, Instituto Botânico, University of Lisbon, Portugal. Communicated by Dr. N. van Uden.

This laboratory is dedicated to medical and veterinary mycology; emphasis is on yeasts associated with man and warmblooded animals. The following studies in the field of yeasts have been performed during the last two years:

(1) N. van Uden & L. Assis Lopes. Sobre as Leveduras do quefir. Boletim Pecuario (Lisbon), 23, 3, 1955.

The yeasts of five samples of kefir grains obtained from various countries were studied. Saccharomyces delbrueckii was the predominant organism in three samples S. italicus and S. willianus in the two other samples. None of these yeasts ferments lactose, but all ferment glucose and galactose i.e. the products of hydrolysis of milk sugar. Candida krusei and Pichia membranaefaciens were found as contaminants. S. delbrueckii seems highly adapted to life in kefir and kefir grains as it ferments and assimilates only glucose and galactose. It is suggested to use S. delbrueckii for the production of kefir with pure cultures and not a lactose fermenting yeast.

(2) N. van Uden, M. de Matos Faia & L. Assis Lopes. Isolation of Candida albicans from vegetable sources. J. gen. Microbiol. 15, 151-u53, 1956.

Among 180 yeast strains isolated from plants, vegetable - and dairy products, five belonged to Candida albicans; Two were isolated from flowers of furze (Ulex sp.), one from leaves of myrtle (Myrtus communis) one from a sample of "hongo" and one from sour non-bottled wine.

(3) N. van Uden. A rapid method for testing raffinose fermentation by yeasts, J. Bacteriol. (Accepted for publication).

Raffinose broth in Durham tubes is inoculated with the yeast under study. If fermentation occurs the tube is left until the amount of gas in the insert begins to decrease. Then 0.5 ml of

the broth (it is not necessary to centrifuge as the yeast cells present in the broth will not interfere with the test) are placed in a test tube together with 5 ml of Benedict's qualitative reagent. This mixture is boiled for three minutes and cooled. When the solution remains blue and transparent the yeast under study ferments raffinose completely; when a greenish, yellowish or reddish precipitate forms the yeast does not ferment melibiose (or ferments it incompletely). As raffinose is non-reducing any residual raffinose will not interfere with the test.

(4) N. van Uden & L. do Carmo Sousa. Presumptive tests with liquid media for coliform organisms in yoghurt in the presence of lactose fermenting yeasts, Dairy Industries (Accepted for publication).

Yoghurt may be heavily infected with lactose fermenting yeast. Candida pseudotropicalis was found in 96 out of 136 samples of commercial yoghurts mostly in numbers between 10.000.000 and 60.000.000 per ml.

It was found that coliform free yoghurt produced in the laboratory, containing 6.850.000 or more cells of a strain of C. pseudotropicalis per ml may give false positive reactions for coliform organisms when brilliant green lactose peptone bile is used. With formate ricinoleate lactose peptone broth however no false positive reactions were obtained with as much as 340.000.000 cells of C. pseudotropicalis per ml of inoculated yoghurt.

(5) N. van Uden & L. do Carmo Sousa. Yeasts from the bovine caecum. J. gen. Microbiol. (Accepted for publication).

From the caeca of 252 adult bovines 131 yeast strains were isolated distributed among the following species: Saccharomyces cerevisiae (12), S. chevalieri (3); S. drosophilarum (3), S. fragilis (1), Pichia bovis (1), P. membranaefaciens (3), P. fermentans (3), Cryptococcus diffluens (1), Torulopsis glabrata (4), T. sp. (2), Candida tropicalis (45), C. krusei (33), C. utilis (10), C. parapsilosis (3), C. macedoniensis (1), C. bovina (1), Trichosporon cutaneum (5). No strain of C. albicans was isolated; the apparent absence of C. albicans from the bovine intestinal tract may explain the rareness of oral and intestinal moniliasis in bovines.

Pichia bovis sp. nov. resembles P. xylosa and Petasospora rhodanensis (the latter two were found to be identical), but differs by its short oval cells, the absence of pseudomycelium and the assimilation of L-arabinose.

Candida bovina sp. nov. has the same fermentation and assimilation pattern as Torulopsis pintolopesii. Its cells are however much bigger, pseudomycelium is formed and growth at room temperature occurs.

(6) N. van Uden, M. de Matos Faia & L. Assis Lopes. The relationship of Candida claussenii to C. albicans, Revista de Biologia (Lisbon) Vol. I, 1955-56 (in press).

The type strain of C. claussenii was compared with various strains of C. albicans. C. claussenii assimilates the same compounds as C. albicans. C. claussenii is pathogenic for rabbits, guinea pigs and mice; its virulence is of the same order as that of C. tropicalis i.e. less virulent than C. albicans. With aglutination and cross-aglutinations tests using absorbed and non-absorbed anti-sera complete cross reactivity between C. albicans and C. claussenii was found.

IV. Ministry of Agriculture, Fisheries and Food, Veterinary Laboratory, New Haw, Weybridge, Surrey, England. Communicated by Dr. P. K. C. Austwick.

The nature of the work here is in the first place, the diagnosis of mycotic infections in animals and as such, involves primary isolation from suspect infected tissues. In a great many of the isolations from internal organs, such as lungs and the alimentary canal, yeasts are the predominating organisms obtained. Such isolates are freed from bacteria and maintained in culture until such time as their morphological and physiological characteristics have been studied and a tentative name obtained.

The results of such a procedure are given in the papers* describing the work of the Agricultural Research Council Survey on Animal Mycoses and I now have as many further yeast isolates to identify as we had at the end of this survey. This accumulation of isolates will require considerable attention before it is possible to produce another list of species but I am sure they are of considerable importance in the consideration of the etiology of a great many pathological conditions in animals.

*References:

G. C. Ainsworth and P. K. C. Austwick

"A Survey of Animal Mycoses in Britain: General Aspects." Vet. Rec. 67, 88, 1955.

"A Survey of Animal Mycoses in Britain: Mycological Aspects." Trans. Brit. Mycol. Soc. 38, 369, 1955.

V. United States Department of Agriculture, Agricultural Research Service, P. O. Box 5578, Raleigh, North Carolina. Communicated by Dr. John L. Etchells.

The following is a cooperative project between the U. S. Food Fermentation Laboratory and the North Carolina Agricultural Experiment Station.

"Investigations have continued on the yeast flora of cucumber brines, particularly as influenced by addition of the chemical sorbic acid and its sodium salt. Approximately 1,000 cultures have been isolated and identified during the past 3 seasons in cooperation with Dr. A. F. Borg of the Biological Sciences Division.

Work is being completed on the populations and species of yeasts occurring on the growing cucumber plant (flowers, ovaries and fruit) from commercial fields in Eastern North Carolina. Approximately one-half of the isolates belonged to the genus Rhodotorula.

During the past year, a new study on the biosynthesis of carotenoids in yeasts of the genus Rhodotorula has been initiated in cooperation with Dr. W. J. Peterson, Head, Chemistry Department. Investigations to date have dealt with the complete characterization of the principal pigments of 7 known species and 1 variety of the above genus. Carbon assimilation tests and vitamin requirements have been determined for these yeasts as well as growth studies on various chemically defined media.

A recent article, "Pectin Hydrolysis by Certain Salt-Tolerant Yeasts" (by Bell and Etchells) appeared in Applied Microbiology (Vol. 4, No. 4, pp. 196-201. 1956)."

VI. University of California, Department of Food Technology, Davis, California. Reported by Dr. H. J. Phaff.

1. Dr. J. Lodder (Delft, the Netherlands) visited our Department for approximately one week in the beginning of July. Her visit stimulated extensive discussions of mutual interest pertaining to the taxonomy and ecology of yeasts. During her stay a field trip to the Sierra Nevada mountains was organized during which yeasts were collected from various biological materials. It was a great pleasure and privilege to have Dr. Lodder as our guest.

2. The work by Dr. R. de Camargo (see the previous issue of the Yeast News Letter) on yeasts isolated from Drosophila flies and fermenting tomatoes is nearing completion. One of the common species was found to be identical to Pichia kluyveri Bedford. The main difference between this species and P. fermentans Lodder is that the latter can utilize D-xylose and forms a pseudomycelium, whereas the former lacks this ability. Both organisms require vitamins in a synthetic medium.

3. A study was initiated on the yeast flora of Calimyrna figs which require pollination by the Blastophaga wasp. It was found that a single species of yeast (closely related to Candida guilliermondii) and a single species of bacterium (Serratia plymouthicum) are almost invariably associated with the fig wasp and are introduced in a high percentage of Calimyrna figs. These two organisms do not cause spoilage. Later when Drosophila flies and the dried fruit beetle (Carpophilus hemipterus) make their entry into the orchards, the yeast flora changes abruptly and the organisms mentioned above are rapidly overgrown by apiculate yeasts, Pichia, Torulopsis and several miscellaneous species. Only one isolate of Saccharomyces (S. veronae) was encountered in the survey. The latter organisms cause active spoilage and fermentation. Various bacteria are also present at this stage.

4. We have built a slightly modified model of the multipoint inoculator, developed by F. W. Beech, J. G. Carr and R. C. Codner (J. Gen. Microbiol. 13, 408, 1955). We found this instrument vastly superior to the velvetine cloth method (J. Bact. 68, 28, 1954) developed by us for the study of carbon-assimilation reactions of yeasts. The multipoint inoculator can be

used for an indefinite number of replicate platings, gives identical inocula each time and the problem of "smearing" is avoided.

5. The study of the genus Saccharomycopsis (by M. Shifrine) and a study of the apiculate yeasts (by M. W. Miller) are continuing. Mr. R. T. Streutker has initiated a study of strain differences in brewers yeasts.

6. The following papers have been published since the appearance of the last News Letter.

Yeasts occurring in olive brines during the fermentation and storage of green olives. E. M. Mrak, R. H. Vaughn, M. W. Miller and H. J. Phaff. Food Technol. 10, 416-419, 1956.

Studies on the ecology of Drosophila in the Yosemite Region of California

I. The occurrence of species of Drosophila in different life zones and at different seasons. D. M. Cooper and Th. Dobzhansky (Columbia University). Ecology 37, 526, 1956.

II. Yeasts found in the alimentary canal of Drosophila. H. J. Phaff, M. W. Miller, J. A. Recca, M. Shifrine, E. M. Mrak (University of California). Ecology 37, 533, 1956.

III. The yeast flora of the natural breeding sites of some species of Drosophila. H. L. Carson, E. P. Knapp and H. J. Phaff (Washington University, St. Louis and University of California). Ecology 37, 538, 1956.

IV. Differential attraction of species of Drosophila to different species of yeast. Th. Dobzhansky, D. M. Cooper, H. J. Phaff, E. P. Knapp and H. L. Carson (Columbia University, University of California and Washington University). Ecology 37, 544, 1956.

VII. Southern Illinois University, Carbondale, Illinois. Communicated by Dr. Carl C. Lindegren.

Dr. Susumu Nagai, Associate Professor from the Osaka City University in Japan, is spending one year in the Biological Research Laboratory.

Dr. and Mrs. Carl C. Lindegren and Mr. Ernest Shult attended the meetings of the International Genetics Symposia in Tokyo, Japan in September. Dr. and Mrs. Lindegren presented papers to the Symposia and Dr. Lindegren gave lectures before the Mycological Society of Japan, Kyoto University and Misima Institute.

Since the last publication of the Yeast News Letter, the following articles dealing with yeast or yeast genetics have been published or accepted for publication:

(1) Lindegren, C. C. and Lindegren, G. The effect of the local chromosomal environment upon the genotype. Nature 178, 796-97 (1956).

(2) Middlekauff, J. E., Hino, S., Yang, S. P., Lindegren, G. and Lindegren, C. C. Gene control of resistance to cadmium in Saccharomyces. J. of Bacteriol. (accepted for publication).

(3) Lindegren, C. C. The possible application of yeast genetics to brewing. American Society of Brewing Chemists Proceedings (to be published).

(4) Lindegren, C. C. and Shult, E. E. The interpretation of genetical data. Experientia (accepted for publication).

(5) Shult, E. E., Lindegren, C. C. and Lindegren, G. Mapping methods in tetrad analysis. II The localized cross-over. Genetica (accepted for publication).

(6) Lindegren, C. C. and Hino, S. The effect of anaerobiosis on the origin of respiratory-deficient yeast. Exp. Cell Research (accepted for publication).

(7) Middlekauff, J., Hino, S., Yang, S. P., Lindegren, G. and Lindegren, C. C. Gene control of resistance vs. sensitivity to actidione in Saccharomyces. Genetics (accepted for publication).

(8) Lindegren, C. C., Pittman, D. D. and Ranganathan, B. Orderly degradation of the MZ locus by ultraviolet radiation and its regeneration by contact with substrate. International Genetics Symposia, Japan (to be published).

(9) Middlekauff, J. E., Hino, S., Yang, S. P., Lindegren, G. and Lindengren, C. C. Gene control of resistance vs. sensitivity to cadmium and actidione in Saccharomyces. International Genetics Symposia, Japan (to be published).

(10) McClary, D. O., Williams, M. A. and Lindegren, C. C. Chromosome counts in a polyploid series of Saccharomyces. J. of Bacteriol. (accepted for publication).

(11) Ogur, M. and St. John, R. A differential and diagnostic plating method for population studies of respiration deficiency in yeast. J. of Bacteriol. 72, 500-504 (1956).

(12) Pittman, D. D. The relation of population heterogeneity to the plateau phenomenon in radiation dose response curves. J. of Bacteriol. 71, 500-501 (1956)

(13) Pittman, D. D. and Pedigo, P. R. Demonstration by x-ray inactivation of the haploid state of the four clones of yeast derived from an irregularly segregating ascus. Genetica 28, 27-30 (1956).

(14) Ogur, M. and St. John, R. C. Demonstration by cellular nitrogen and turbidity of the haploid state of the four clones of yeast derived from an irregularly segregating locus. Genetica 28, 25-26 (1956).

(15) Lindegren, C. C., Lindegren, G., Drysdale, R. B., Hughes, J. P., and Brenes-Pomales, A. Genetical analysis of the clones from a single tetrad of Saccharomyces showing non-Mendelian segregation. Genetica 28, 1-24 (1956).

(16) Shult, E. E. and Lindegren, C. C. Mapping methods in tetrad analysis. I. Provisional arrangement and ordering of loci preliminary to map construction by analysis of tetrad distribution. Genetica 28, 165-176 (1956).

VIII. Carlsberg Laboratorium, Physiological Department, Copenhagen, Denmark. Communicated by Dr. C. Roberts.

At present Dr. E. Greve from Professor Marquardt's laboratory in Freiburg is with us learning the techniques of single cell isolation and spore hybridization for the purpose of employing them in investigations on yeast mitochondria.

The following papers are shortly to be published:

Losada, M.: The hydrolysis of raffinose by yeast melibiose and the fermentation of raffinose by complementary gene action.

Winge, Ø. and Roberts, C.: A genetic analysis of melibiose and raffinose fermentation.

Winge, Ø. and Roberts, C.: Remarks on irregular segregations in Saccharomyces.

IX. Brandeis University, Waltham 54, Massachusetts. Communicated by Dr. Harold P. Klein.

It may be of some interest to the readers of the "Yeast News Letter" that the microbiology program leading to the Masters Degree at Brandeis University has been discontinued, and that, in its place, the University is now offering graduate work leading to the M. A. and Ph. D. Degrees in Biology. Emphasis in the new program is being placed on the following four fields: genetics, microbiology, physiology, and development.

My own work on the synthesis of lipids in yeasts and in yeast preparations is continuing. A portion of this was presented at the symposium on cellular structure and function held last May in Houston, Texas, by the Society of American Bacteriologists. Further details are to appear in the Journal of Bacteriology in a forthcoming issue.

X. The Ohio State University, Department of Botany and Plant Pathology, Columbus 10, Ohio. Communicated by Dr. William D. Gray.

We have under way and are starting a number of yeast problems in our laboratory.

Mr. Norman Davis is working on the metabolic pathway of ethyl acetate synthesis in Hansenula anomala.

Miss Fern Och is working on the metabolism of nitrogen compounds by species of the genus Hansenula.

Mr. Glenn Beach is attempting to identify a non-volatile acid formed by Hansenula anomala.

Dr. W. D. Gray and Carl Sova are studying the effects of alcohols on enzyme systems.

XI. Massachusetts Institute of Technology, Department of Food Technology, Cambridge 39, Massachusetts. Communicated by Dr. Cecil G. Dunn.

Dr. Koichi Yamada, Assistant Professor of Industrial Microbiology at the University of Tokyo, is spending 10 months as a guest in the Department of Food Technology, M. I. T. He is presently engaged in research relating to aeration problems in fermentation.

Dr. William Timson, recent recipient of a Sc.D. degree in the field of Biochemical Engineering, Department of Food Technology, M. I. T., presented a paper with Dr. Cecil G. Dunn on "Mechanism of Gas Absorption from Bubbles Under Shear in Agitated Liquids", at the September meeting of the American Chemical Society in Atlantic City, New Jersey.

At the same meeting Dr. George Fuld and Dr. Cecil G. Dunn presented a paper on an apparatus designed to control sugar concentration in the fermentation medium automatically.

XII. National Research Council, Prairie Regional Laboratory, Saskatoon, Saskatchewan, Canada. Communicated by Dr. Willard A. Taber.

The following paper concerning "yeast-like fungi" by Walter J. Nickerson, Willard A. Taber and G. Falcone appeared in the October issue of "The Canadian Journal of Microbiology". This paper is titled "Physiological Bases of Morphogenesis in Fungi. 5. Effect of selenite and tellurite on cellular division of yeast-like fungi."

In this laboratory we have initiated a time-lapse study of Pullularia pullulans, but to date have succeeded only in determining the working conditions for the study and in obtaining one film which shows that "filament" growth is by apical elongation. It is hoped that soon we will be able to examine further the Geotrichum sp. isolate included in the study referred to above.

XIII. University of California, Department of Viticulture and Enology, Davis, California. Reported by Dr. J. G. B. Castor.

Phosphate uptake by yeast cells (Saccharomyces) during growth in grape must. The amount of uptake of inorganic phosphate during the period of yeast cell growth in fermenting must was estimated, with and without addition of phosphate and ammonia, at two temperatures. Phosphate uptake averaged .00158 mg/10^6 cells at 70°F (21.1°C) and .00146 mg/10^6 cells at 52°F (11.1°C), in 4 different sets of fermentations in the same grape must. The variation from the average was about 6 percent at 72°F and about 13 percent at 52°F.

Published by T. E. Archer and J. G. B. Castor in American Journal of Enology 7 (2): 62-68 (1956).

Nutrient requirements of the film stage of Saccharomyces beticus Marcilla et al. The film stage of this yeast is involved in flavor formation in the preparation of certain types of sherry wine. The nutrient

requirements for film growth were studied with a chemically defined medium simulating the composition of wine. Information on the B-vitamins and amino acids of wine was obtained from earlier work. The results indicated that pantothenate was required for initiation of film growth. β-alanine could substitute for pantothenate, α-alanine could not. Other vitamins were stimulatory, but did not support growth in the absence of pantothenate or β-alanine. The requirement for pantothenate is of interest in view of the strong acetate metabolism of the film stage of this yeast. The amino acid requirements have not yet been clearly defined. In press in Applied Microbiology.

XIV. Sulphite Pulp Manufacturers' Research League, 1101 East South River Street, Appleton, Wisconsin. Communicated by Dr. Averill J. Wiley.

Research and development studies by the staff of the Sulphite Pulp Manufacturers' Research League continues in the field of process and product development for the member pulp mills of the League which have active interest in torula type yeast (Candida utilis). Two member mills have full-scale commercial plants producing food and feed yeasts for the United States and foreign markets. Favorable action of the U.S. Pharmacopoeia approving torula type yeast for human foods and the pharmaceutical fields has stimulated production for those markets.

A laboratory study of the amino acid content of torula yeast was reported at the September, 1956 meeting of the American Chemical Society by George A. Dubey, Jr., A. J. Wiley, and Peter Gfeller under the title "An Analysis of Amino Acids in Torula Yeast (Torulopsis utilis) by a Modified Moore and Stein Chromatographic Method." This paper has been submitted to Agricultural and Food Chemistry for publication. Reports have been recently received from Taiwan (Formosa) that the huge new torula yeast plant designed for producing 40 metric tons of dry yeast daily is now in production using Formosan molasses as the raw material from which yeast is produced for human food and animal feeds. The Nationalist Island hopes to become self-sufficient in producing proteins for use on the Island.

XV. National Taiwan University, Taipei, Taiwan. Communicated by Dr. T. S. Pang.

Dr. T. S. Pang, professor of food chemistry and technology, is spending a year as Visiting Professor at the University of California at Davis in the Department of Food Technology under a Fellowship sponsored by the International Cooperation Administration (contract between the University of California and National Taiwan University).

During the past three years, Dr. Pang and collaborates worked on methods to improve the utilization of yeast food and developed a new product, called "yeast milk". By a new process of peptonizing the yeast, a very stable hydrophilic colloidal solution could be produced, which remained stable during two years of storage. The canned yeast milk did not coagulate or separate due to action of heat, calcium or iron.

The significance of this work is two fold. First, the creamy yeast milk can be used (like emulsified cod liver oil) as a source of the vitamin B complex and if irradiated as a source of vitamin D. Second, it furnishes a method of converting vegetable protein to a more available form. Commercial application of the process appears to be promising.

XVI. Lake States Yeast Corporation, Rhinelander, Wisconsin. Communicated by Dr. Paul L. Pavcek.

FEEDING TROUT ON TORULA YEAST*

Summary

Dry pelleted rations containing 4, 8 & 15% levels of (1) Torula Feed Yeast, (2) High Thiamine Torula Feed Yeast, (3) Food Grade Torula Yeast, and (4) a primary grown Saccharomyces cerevisiae yeast were compared in six month growth studies with fingerling Rainbow Trout. The yeasts were also evaluated as a source of biotin by noting their ability to prevent Blue Slime in the fish. All yeast levels gave full protection in this regard.

Eight percent levels of all yeasts demonstrated similar good growth and high feed efficiency - 4% and 15% levels gave slightly lower values but showed definite superiority over the non-yeast containing basal diet.

The losses of thiamine, riboflavin, niacin, folic acid, pantothenic acid, biotin and pyridoxine before and after pelleting and up to six months storage at room temperature were insignificant.

The studies were conducted as a collaborative project between the Wisconsin Conservation Department and the Lake States Yeast Corporation. The work was reported at the American Fisheries Society Meeting in Toronto in September.

*A complete paper of this work has been prepared entitled "A comparison of two dried yeasts, Candida utilis and Saccharomyces cerevisiae as supplements in a diet for rainbow trout" by Richard I. Stevens and John R. Truog. Wisconsin Conservation Department, Madison, Wisconsin.

XVII. Red Star Yeast & Products Company, Milwaukee, Oakland, New Orleans. Communicated by Dr. H. J. Peppler.

Four publications from our Research Department appeared in various journals:

1 - "Carbon Dioxide Sorption by Yeast"
Amsz, Dale and Peppler, Science 123: 3194 (1956)

2 - "Destruction of Cocarboxylase in Active Dry Yeast"
Chen and Peppler, Arch. Biochem. and Biophys. 62: 299 (1956)

3 - "Conversion of Cinnamaldehyde to Styrene by a Yeast Mutant"
Chen and Peppler, J. Biol. Chem. 221: 101 (1956)

4 - "Loss of Cell Constituents on Reconstitution of Active Dry Yeast"
Herrera, Peterson (Univ. of Wisconsin), Cooper and Peppler, Arch. Biochem. Biophys. 63: 131 (1956)

Dr. Gerald Reed has joined the company in April as Director of Research.

Dr. John W. Ross is a new staff member of the Biochemistry Laboratory. He is a graduate of the University of Wisconsin.

Dr. John C. Garey succumbed to a lingering illness on August 16.

XVIII. Miscellaneous News Items.

1. Dr. Caroline Raut of the Detroit Institute of Cancer Research writes that she was married on August 11, 1956, to Edwin E. Hebb, Jr. who is an engineer with the Detroit Diesel Engine Division of General Motors. She will now be carrying out household chores as well as yeast research.

Mr. Robert Doyle is a Ph.D. student in microbial genetics at Wayne State University, who is working on an irradiation problem with Dr. Raut Hebb. He is on the staff at Assumption College in Windsor, Canada.

(I am sure I am speaking for all our readers in congratulating you and wishing you the best of luck. The Editor)

2. CHANGE IN ADDRESS.

The street address of the Southern Utilization Research Branch, ARS, has been changed to:

1100 Robert E. Lee Boulevard

Please change your records accordingly.

3. Dr. Hal Ellis, Director of the Caja de Credito Agrario, Industrial y Minero, Instituto de Investigaciones Tecnologicas, Bogota, Colombia, writes as follows:

I regret to inform you that Dr. Paul J. Kolachov who has been on your mailing list of the "Yeast News Letter", and who was the first Director of this Institute, died last February. I have replaced him in this capacity. By training I am a microbiologist and biocide specialist.

Our Institute, the Colombian Government's central Technological Research Institute, has approximately the same functions as the U.S.D.A. Regional Research Laboratories. We have a section on food technology, one on industrial microbiology, one on agricultural engineering, one on engineering economics, etc. Our present staff numbers 62 but is scheduled to be increased to between 250 and 300. We are now planning on a yeast food project similar to the work being done in Puerto Rico and a Chlorella project.

4. Professor V. Kudriavtsev, Institute for Microbiology, Academy of Sciences, Bolshaya Kaluzskaya 33, Moscow V-71, U.S.S.R., informed the Editor that he would very much appreciate receiving critical comments on his attempt to suggest a new scheme of classification for the yeasts. (For an outline of his new book see the May 1956 issue of the Yeast News Letter--Editor.)

5. Dr. Anthony Rose, one of our readers in England, writes that he is presently fulfilling his military service duty in the R.A.F. In September, 1957, he plans to return to academic research on yeasts. The following review of which he is co-author has appeared recently:

"Yeasts" in Encyclopedia of Chemical Technology, Vol. 15, 195-219, 1956, by W. J. Nickerson and A. H. Rose. The Interscience Encyclopedia, Inc., New York.

6. As a result of the "Round Table Discussion on Yeast Problems" at the last Annual Meeting of the Society of American Bacteriologists, it was decided that an attempt should be made to have as many yeast papers as possible included in a single session rather than have them scattered among numerous sessions. Those who plan to present a paper dealing with a yeast problem are encouraged to inform the Program Chairman of their desire to have their paper included in a "yeast session".

Herman J. Phaff - Editor