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BIBLIOGRAPHY
OF
VITAMIN B COMPLEX

BY
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INTRODUCTION

The multiple nature of vitamin B has led to a confusion of terminology. Vitamin B is a complex composed of at least two chief factors, one relatively heat labile and the other comparatively heat stable.

The heat labile factor is known as vitamin B₁. It has also been named vitamin F and called the "B-P" factor. It is characterized by its ability to prevent and cure polyneuritis and beriberi so is designated as the "anti-neuritic" or the "anti-beriberi" vitamin. It is soluble in water so was originally known as the "water-soluble" vitamin.

Vitamin B (B₁) (1) prevents and cures polyneuritis, (2) prevents beriberi, (3) stimulates appetite, (4) promotes growth, (5) aids digestion and assimilation, (5) is related to carbohydrate and fat metabolism, (6) is essential for reproduction and (7) causes increased lactation.

Its deficiency is indicated by the presence of polyneuritis, beriberi, loss of appetite, loss in weight, intestinal infection, convulsions, and head retraction.

Chemically, it is comparatively stable toward dry heat, is heat labile in alkaline and acid solution, has

a low molecular weight, is soluble in water, is insoluble in fats and oils, is readily absorbed by fuller's earth, and has been assigned the formula $C_{12}H_{16}N_4OS$.

Good sources of this vitamin are asparagus, beans, bran, buckwheat, grains, nuts, liver, oysters, peas, peppers, pork, spinach, wheat, and yeast.

The second factor of the vitamin B complex is known as vitamin B_2 . It is also called vitamin G, and the "P-P" factor. It is characterized by its ability to stimulate growth so is designated as the "growth-promoting" vitamin. It cures and prevents pellagra-like symptoms so has been called the "anti-pellagic" vitamin. It is soluble in fat so was originally known as the "fat-soluble" vitamin.

Vitamin G (B_2) (1) improves growth, (2) promotes general health, (3) prevents or cures pellagra and (4) is essential in nerve tissues.

Its deficiency is indicated by the presence of pellagra, dermatitis, weakness, breakdown of the central nervous system, cataract, loss of hair, and ulceration of the tongue.

Chemically, it is stable toward heat, is soluble in fat, is fairly stable to oxidation and acids and is destroyed in high alkaline concentration. It has been assigned the chemical formula of $C_{17}H_{20}N_4O_6$. It contains a flavin substance and a second non-flavin factor. Both are essential for growth and health. The non-flavin component is the anti-dermatitis factor and the anti-

black tongue factor for dogs.

Good sources of this vitamin are beet tops, broccoli, cheese, eggs, heart, kidney, liver, milk, dried prunes, rice polishings, spinach, and wheat germ.

Vitamin B₃ is also known as the undifferentiated vitamin B₁, the Williams-Waterman B₃ and the Randoin-Lecoq B₃.

It was found that vitamins B₁ and B₂ are not sufficient for optimum growth and that this undifferentiated component provides the factor necessary for that condition. It is insoluble in water and alcohol, is heat stable, and is heat labile in alkaline media under pressure. It is found in yeast, whole grains, and malt.

Vitamin B₄ is similar to B₁. It seems to be the antineuritic principle but this is not definitely known. It is found in dried grass, peanuts, wheat germ, pork brain and pork kidney.

Vitamin B₆ is also designated as factor Y and vitamin H. It is essential for growth and for the health of the skin of the rat. It is found in cereals.

Osborne, T. B., Van Slyke, D. D., Leavenworth, C. S., and Vinograd, M.

1915

Some Products of Hydrolysis of Gliadin, Lactalbumin, and the Protein of the Rice Kernel

Jour. Biol. Chem., 22, p. 259.

Suggests that the fact that polished rice more nearly resembles the majority of the proteins of animal tissues than do the proteins of maize or wheat may explain the extensive use of rice as an almost exclusive diet in spite of its low protein content.

McCollum, E. V., and Kennedy, C.

1916

The Dietary Factors Operating in the Production of Polyneuritis

Jour. Biol. Chem., 24, p. 491.

Finds that the water-soluble accessory is directly concerned in the prevention and cure of polyneuritis in pigeons and the fat-soluble fraction is related to maintenance.

Williams, R. R., and Seidell, A.

1916

The Chemical Nature of the "Vitamines"

Jour. Biol. Chem., 26, p. 431.

States that the chemical entity responsible for the characteristic physiological properties of the "vitamine" under investigation is an isomer of adenine.

Funk, C.

1916

The Study of Certain Dietary Conditions Bearing on the Problem of Growth in Rats

Jour. Biol. Chem., 27, p. 1.

Reports that yeast promotes growth, but the Seidell vitamine preparation from autolyzed yeast with Lloyd's Reagent was greatly deficient in the growth stimulant and lost some of its antiscorbutic property.

Funk, C., Lyle, and McCaskey

1916

The Nutritive Value of Yeast, Polished Rice, and White Bread, as Determined by Experiments on Man

Jour. Biol. Chem., 27, p. 173.

Finds that the nitrogen in yeast, white bread, and polished rice has no apparent food value and a positive balance of nitrogen cannot be maintained by the addition of vitamine.

Funk, C., and McCollum, E.

1916

Studies on Growth

Jour. Biol. Chem., 27, p. 63.

Reports that autolyzed yeast contains at least two vitamins: one which will cure polyneuritis and one which will stimulate growth.

McCollum, E. V., Simmonds, N., and Pitz, W. 1916

The Relation of the Unidentified Dietary Factors, the Fat-Soluble A, and Water-Soluble B, of the Diet to the Growth-Promoting Properties of Milk

Jour. Biol. Chem., 27, p. 33.

States that the chemical natures of the fat-soluble A and water-soluble B are of such a character that they cannot be formed within the animal body from any of the cleavage products of proteins.

Emmet, A. D., and McKim, L. H. 1917

The Value of the Yeast Vitamine Fraction as a Supplement to a Rice Diet

Jour. Biol. Chem., 32, p. 409.

Reports that there are two so-called "vitamines" associated with rice polishing, one which produces weight, and one which has a curative action, the Seidell yeast "vitamine". The activated yeast "vitamine" is not a complete supplement to a polished rice diet.

McCollum, E. V., and Pitz, W. 1917

The "Vitamine" Hypothesis and Deficiency Diseases

Jour. Biol. Chem., 31, p. 229.

Polyneuritis is caused by a deficiency of a specific substance (water-soluble B) in the diet. Polyneuritis is the only "deficiency disease".

McCollum, E. V., and Simmonds, N. 1917

A Biological Analysis of Pellagra-Producing Diets

Jour. Biol. Chem., 32, p. 181.

McCollum, E. V., Simmonds, N., and
Steenbock, H.,

1917

A Method for the Separation of the Dietary
Essential, "Fat-Soluble A", from Butter Fat

Jour. Biol. Chem., 24, p. xxvi.

Reports that fat-soluble "vitamine" can be
separated from melted butter fat by shaking it
with successive portions of water.

Osborne, T. B., and Mendel, L. B.

1917

The Role of Vitamines in the Diet

Jour. Biol. Chem., 31, p. 149.

States that the effect, on the addition of
yeast, of the increase of the appetite must be
secondary to the more direct effect upon the
growth processes.

Seidell, A.

1917

The Vitamine Content of Brewer's Yeast

Jour. Biol. Chem., 29, p. 145.

The clear filtrate from autolyzed brewer's
yeast contains more "vitamine" than the dried
freshly pressed yeast. The autolyzed dried yeast
contains more "vitamine" than dried yeast not
autolyzed.

Steenbock, H.

1917

Antineuritic Substance from Egg Yolk

Jour. Biol. Chem., 24, p. xxvii.

Reports that a water-acetone-soluble fraction
can be separated from egg yolk. It can cure
polyneuritis, is stable to Hydrochloric Acid at
98° C. and to concentrated alkalies at room
temperature. It is not adenine.

Williams, R. R.

1917

The Chemical Nature of the "Vitamines"

Jour. Biol. Chem., 29, p. 495.

Dutcher, R.

1918

Vitamine Studies I

Jour. Biol. Chem., 36, p. 63.

Reports that the water-soluble "vitamines" function, directly or indirectly, in the stimulation of oxidative processes, thereby clearing the tissues of toxic materials.

Dutcher, R., and Collatz, F. A.

1918

Vitamine Studies II

Jour. Biol. Chem., 36, p. 547.

States that water-soluble B does not act as a direct activator of catalase, but instead probably (on account of its physiological properties) stimulates the organism to greater production of catalase.

Dutcher, R.

1918

Vitamine Studies III

Jour. Biol. Chem., 36, p. 551.

Honey contains a small amount of water-soluble "vitamine", but the amount is negligible.

A Study of the Dietary Essential, Water-Soluble B, in Relation to its Solubility and Stability Towards Reagents

Jour. Biol. Chem., 33, p. 55.

Finds that water-soluble B shows relatively great stability toward hydrochloric acid.

Osborne, T. B., and Mendel, L. B.

1918

Milk as a Source of Water-Soluble Vitamine

Jour. Biol. Chem., 34, p. 537.

Reports that the antineuritic "vitamines" are present in milk in slight amounts only. The young of healthy mothers are probably born with a reserve supply to maintain them in good nutritive condition until the time when they begin to eat other foodstuffs.

Steenbock, H., Boutwell, P. W. and Kent, H.

1918

Fat-Soluble Vitamine

Jour. Biol. Chem., 35, p. 517.

States that Oleomargerine does not contain a good amount of fat-soluble "vitamine".

Bachmann, F. M.

1919

Vitamine Requirements of Certain Yeasts

Jour. Biol. Chem., 39, p. 235.

States that some yeasts can cause fermentation in a medium which contains little or no "vitamines" and some cannot.

Vitamine Studies

Jour. Biol. Chem., 39, p. 63.

Reports that thyroxin, dessicated thyroid gland, pilocarpine hydrochloride, and tethelin relieve paralytic symptoms of polyneuritis.

Osborne, T. B., and Mendel, L. B.

1919

The Vitamines in Green Foods

Jour. Biol. Chem., 37, p. 187.

States that water-soluble "vitamine" has a direct relation to appetite. Spinach leaves are rich in water-soluble and fat-soluble "vitamines". Cabbage leaves have little water-soluble "vitamine".

Emmet, A. D., and Luros, G. O.

1919

The Absence of Fat-Soluble A Vitamine in Certain Ductless Glands

Jour. Biol. Chem., 38, p. 441.

Reports that benzene or acetone does not extract from the pancreas, thymus, and suprarenal glands a fat that contains the fat-soluble A "vitamine".

Osborne, T. B., and Mendel, L. B.

1919

The Nutritive Value of Yeast Protein

Jour. Biol. Chem., 38, p. 223.

Reports that animals which had yeast as the sole source of water-soluble "vitamine" were found to be sterile.

The Action of Radium on the Vitamines of Yeast

Jour. Biol. Chem., 39, p. 421.

Reports that the growth-promoting factors in yeast may be inactivated partially by means of exposure to radium emanation.

Williams, R. J.

1919

The Vitamine Requirement of Yeast

Jour. Biol. Chem., 38, p. 465.

The water-soluble, beri-beri-preventing "vitamine", relatively so abundant in yeast, is necessary for the nutrition of yeast cells themselves. The fat-soluble "vitamine" apparently has no effect on yeast growth.

Cajori, F. A.

1920

Some Nutritive Properties of Nuts; Their Proteins and Content of Water-Soluble Vitamine

Jour. Biol. Chem., 43, p. 583.

Finds that nuts are sources of abundant quantities of water-soluble "vitamine".

Eddy, W. H., and Stevenson, H. C.

1920

Studies in the Vitamine Content

Jour. Biol. Chem., 43, p. 295.

A new technique for "vitamine" measurement was presented along with experiments conducted with both the Bachmann and Williams technique.

Emmett, A. D., and Stockholm, M.

1920

Water-Soluble Vitamines

Jour. Biol. Chem., 43, p. 287.

Finds that the yeast growth-promoting factor does not appear to be the same as the antineuritic or antiberi-beri "vitamine".

Emmett, A. D., and Luros, G. O.

1920

Water-Soluble Vitamines

Jour. Biol. Chem., 44, p. 265.

Reports that the antineuritic and the water-soluble B "vitamines" are not the same.

Funk, C., and Dubin, H. E.

1920

A Test for Antiberi-beri Vitamine and Its Practical Application

Jour. Biol. Chem., 44, p. 487.

Describes a method for testing the antiberi-beri "vitamine" content of various substances, using autolyzed yeast as a standard.

Karr, W. G.

1920

Some Effects of Water-Soluble Vitamine Upon Nutrition

Jour. Biol. Chem., 44, p. 255.

States that a relation exists between the appetite of a dog and the amount of water-soluble B ingested.

Metabolism Studies With Diets Deficient in
Water-Soluble (B) Vitamine

Jour. Biol. Chem., 44, p. 277.

Reports that the lack of water-soluble "vitamine" B does not affect the utilization of the nitrogen in the alimentary tract of the dog.

Miller, E. W.

1920

The Effect of Cooking on the Water-Soluble
Vitamine in Carrots and Navy Beans

Jour. Biol. Chem., 44, p. 159.

Finds that cooking carrots causes no reduction in the "vitamine". Cooking navy beans decreases the "vitamine" content 40.6% and cooking navy beans in 0.5% sodium bicarbonate solution for one hour and ten minutes causes a loss of 37.5% of the "vitamine". From 36-70% of the "vitamine" is present in the cooking water.

Osborne, T. B., and Leavenworth, C. S.

1920

The Effect of Alkali on the Efficiency of
the Water-Soluble Vitamin B

Jour. Biol. Chem., 45, p. 423.

Reports that water-soluble B is destroyed when heated with alkalies.

Osborne, T. B., and Mendel, L. B.

1920

The Occurrence of Water-Soluble Vitamine in
Some Common Fruits

Jour. Biol. Chem., 44, p. 465.

States that the fresh juices of the edible parts of orange, lemon, and grapefruit contain water-soluble (B) "vitamine". Grape juice contains less. Apples and pears furnish little while prunes are richer in this "vitamine".

A Study of the Factors Which Interfere with the Use of Yeast as a Test Organism for the Antineuritic Substance

Jour. Biol. Chem., 44, p. 113.

States that the use of yeast as a test organism for determining the presence or absence of the antineuritic dietary factor is complicated by so many disturbing factors as to make it of little value.

Steenbock, H., and Boutwell, P. W.

1920

Fat-Soluble Vitamine

Jour. Biol. Chem., 41, p. 81.

Reports that yellow maize kernels give evidence of having the growth-promoting "vitamine" but that white and red maize kernels do not contain demonstrable amounts.

Swoboda, F. K.

1920

A Quantitative Method for the Determination of Vitamine in Connection with Determination of Vitamine in Glandular and other Tissues

Jour. Biol. Chem., 44, p. 531.

Using the Williams biological test, finds that liver and kidney are high in "vitamine" content, thymus and lymph gland are low, and that the thyroid is the only organ in which an increase in concentration of the "vitamine" fraction caused a toxic action.

Whipple, B. K

1920

Water-Soluble B in Cabbage and Onion

Jour. Biol. Chem., 44, p. 175.

Reports that water-soluble B is not destroyed in cabbage or onion by boiling and that not more than one-half of the water-soluble B is lost in the cooking water.

A Quantitative Method for Determination of
Vitamine

Jour. Biol. Chem., 44, p. 259.

Suggests a numerical expression of results whereby the "vitamine" content of any material can be rated in terms of milligrams of yeast produced under given conditions. Presents a quantitative method for the determination of the antineuritic "vitamine", which is based upon gravimetric determination.

Damon, S. R.

1921

Bacteria as a Source of the Water-Soluble B
Vitamine

Jour. Biol. Chem., 48, p. 379.

Reports that *Bacillus paratyphosus* B, *Bacillus coli*, and *Bacillus subtilis* do not produce the growth-promoting principle known as the water-soluble "vitamine".

Fleming, W. D.

1921

Vitamine Content of Rice by the Yeast Method

Jour. Biol. Chem., 49, p. 119.

Reports that the addition of organic nitrogen to the inorganic nitrogen of the culture medium is one factor in the stimulation of yeast growth.

Funk, C., and Dubin, H. E.

1921

Vitamine Requirements of Certain Yeasts and
Bacteria

Jour. Biol. Chem., 48, p. 437.

Separated from "vitamine" B a substance which is called provisionally "vitamine D" and which acts on microorganisms and seems to stimulate the growth of yeast.

Methods of Extracting and Concentrating Vitamines A, B, and C, Together with an Apparatus for Reducing Milk, Fruit Juice, and other Fluids to a Powder Without Destruction of the Vitamines

Jour. Biol. Chem., 48, p. 411.

Gives a method of extracting and concentrating "vitamine" A, B, and C.

Williams, R. J.

1921

Vitamines and Yeast Growth

Jour. Biol. Chem., 46, p. 113.

Concludes that yeast needs for its growth an unknown substance which is identical with the anti-neuritic "vitamine".

Eijkman, C., van Hoogenhuijze, C. J., and Derks, T. J.

1921

The Vitamine Content of Microorganisms in Relation to the Composition of the Culture Medium

Jour. Biol. Chem., 50, p. 311.

The antineuritic factor and the growth-promoting, water-soluble B substance are not identical. The yeast cell can take its antineuritic factor as such from the culture medium and it is not able to synthesize it, but can only regenerate it after it has been denatured by heating.

Kennedy, C., and Dutcher, R. A.

1921

Vitamine Studies

Jour. Biol. Chem., 50, p. 339.

States that the presence of "vitamine" A and B in cow's milk is entirely dependent upon their occurrence in the ration.

Yeast as a Source of Vitamine B for the
Growth of Rats

Jour. Biol. Chem., 54, p. 217.

States that yeast is not so valuable a source
for "vitamine" B as generally believed.

Levine, V. E., McCollum, E. V., and
Simmonds, N.

1922

Glacial Acetic Acid as a Solvent for the Anti-
neuritic Substance, Water-Soluble B

Jour. Biol. Chem., 53, p. 7.

Finds that glacial acetic acid is the best
organic solvent which can be used for the extract-
ion of water-soluble B from plant material.

MacDonald, M. B.

1922

The Synthesis of Water-Soluble B by Yeast
Grown in Solutions of Purified Nutrients

Jour. Biol. Chem., 54, p. 243.

Reports that yeast grown in solutions of puri-
fied nutrients is like yeast grown in other mediums,
as far as synthesis of water-soluble B is concerned.

Orton, C. R., McCollum, E. V., and Simmonds, N. 1922

Observation on the Presence of the Antineuri-
tic Substance, Water-Soluble B, in Chlorophyll-Free
Plants

Jour. Biol. Chem., 53, p. 1.

Finds that water-soluble B is not concerned
with the structure of the chloroplast.

Osborne, T. B., and Mendel, L. B.

1922

Quantitative Aspects of the Role of Vitamine B in Nutrition

Jour. Biol. Chem., 54, p. 739.

Finds that there is a quantitative relationship between the requirement of "vitamine" B and the size of the animal.

Cowgill, G. R.

1923

Studies in the Physiology of Vitamins

Am. Jour. Physiol., 66, p. 164.

Reports that vitamin B, when injected subcutaneously, is too slowly absorbed to bring about relief in severe cases; but where the animal's condition is not critical, subcutaneous injections of vitamin B have a therapeutic value which, however, is not superior to that of administration by mouth.

Funk, C., Harrow, B., and Paton, J. B.

1923

Extraction of Vitamins from Yeast and Rice Polishings with Various Water-Miscible Solvents

Jour. Biol. Chem., 57, p. 153.

Reports that 70% alcohol is the best solvent for vitamin B from yeast. Acetone is a good solvent when the activity of the extract is considered. 60% alcohol is better when using rice polishings.

Heller, V. G.

1923

The Vitamine B Content of Yeast

Jour. Biol. Chem., 55, p. 385.

Claims that yeast synthesizes the growth-promoting and the antineuritic "vitamine".

Jendrassik, A.

1923

A Color Test for Water-Soluble B

Jour. Biol. Chem., 57, p. 129.

Finds that a reduction of ferric ferricyanide with the formation of a blue color is a reaction always given by extracts containing vitamin B.

Levene, P. A., and Muhlfield, M.

1923

On the Identity or Non-Identity of Antineuritic and Water-Soluble B Vitamins

Jour. Biol. Chem., 57, p. 341.

Reports that the antineuritic and the growth-promoting principle are not identical.

Mattill, H. A.

1923

The Utilization of Carbohydrate by Rats Deprived of Vitamine B

Jour. Biol. Chem., 55, p. 717.

Reports that "vitamine" B is not related specifically to the metabolism of carbohydrate.

Osborne, T. B., and Mendel, L. B.

1923

The Effect of Diet on the Content of Vitamine B in the Liver

Jour. Biol. Chem., 58, p. 363.

Finds that the supply of "vitamine" B in liver tissue, where it is ordinarily found in abundance, has direct relation to the supply of "vitamine" B in the diet.

Influence of the Anti-neuritic Vitamin Upon
the Internal Organs of Single Comb White Leghorn
Cockerels

Am. Jour. Physiol., 64, p. 181

Single comb white Leghorn cockerels showed a decrease in the size and weight in the following order: testes, spleen, heart, lever, kidneys, pancreas, and thyroid gland and an increase in the weight of the suprarenals when given a diet deficient in vitamin B.

Steenbock, H., Sell, M. T., and Jones, J. H. 1923

Vitamine B

Jour. Biol. Chem., 55, p. 411.

Reports that rats have little ability to store "vitamine" B.

Steenbock, H., Sell, M. T., and Nelson, E. M. 1923

Vitamine B

Jour. Biol. Chem., 55, p. 399

Reports that when rats are prevented from supplementing their diet by the consumption of excreta the "vitamine" B content of the experimental rations must be at least twice as high.

Willaman, J. J., and Olsen, A. G. 1923

The Bios Requirement of Baker's Yeast

Jour. Biol. Chem., 55, p. 815.

States that bios and water-soluble B are not the same.

The Jendrassik Reaction for Water-Soluble B

Jour. Biol. Chem., 64, p. 589.

Reports that vitamin B does not give a positive reaction of the Mellon or Liebermann test. This is no proof it does not contain a phenol.

Cowgill, G. R., Deuel, H. and Smith, A. H.

1925

Studies in the Physiology of Vitamins

Am. Jour. Physiol., 73, p. 106.

States that a relationship exists between the amount of the vitamin-containing material, the size of the animal in terms of the body-weight, and the number of days over which the appetite is completely restored. Vitamin B does not owe its restorative effect on the appetite to any increased flow of gastric juice which it may produce.

Heller, V. G., McElroy, C. H., Garlock, B

1925

The Effect of the Bacterial Flora on the Biological Test for Vitamin B

Jour. Biol. Chem., 65, p. 255.

Reports that the spore-bearing organisms present in the intestinal tract have a direct relationship to the synthesis and storage of vitamin B.

Kroll, H., and Mendel, L. B.

1925

The Distribution of Vitamin B in the Maize Kernel

Am. Jour. Physiol., 74, p. 674.

Finds that practically all of the vitamin B of the whole grain is found in the embryo of the maize kernel. The endosperm contains practically no vitamin B, while the bran includes an extremely small amount, if any, of this factor.

A Critical Study of the Jendrassik Reaction
for Water-Soluble B

Jour. Biol. Chem., 62, p. 157.

Reports that the ferric ferricyanide reaction proposed by Jendrassik is not a specific test for water-soluble B. Phenols resemble vitamin B with respect to the destructive effect of alkali. Water-soluble B does not give a positive Millon or Liebermann reaction is no proof that vitamin B is not a phenol.

The Jendrassik Reaction for Vitamin B with
Reference to the Work of Bezssonoff and of Levine

Jour. Biol. Chem., 64, p. 591.

Does not claim that the Jendrassik reaction is a general test for phenols, therefore cannot be used as proof that a phenol is present in water-soluble vitamin B.

The Concentration of Vitamin B

Jour. Biol. Chem., 65, p. 483.

Describes a method for the concentration of vitamin B from the "O.-W." concentrate of yeast extract.

Technique in the Use of the Rat for Vitamin
B Studies

Jour. Biol. Chem., 63, p. 547.

Criticizes present technique in the use of the rat for vitamin B studies.

The Role of Vitamine B in Relation to the Size of Growing Rats

Jour. Biol. Chem., 63, p. 233.

Finds that a small variation in the intake of vitamine B shows a corresponding change in growth in the rat.

Salmon, W. D.

1925

Vitamin B in the Excreta of Rats on a Diet Low in this Factor

Jour. Biol. Chem., 65, p. 457.

Rats on a diet deficient in vitamin B made a marked growth when they had access to their excreta. This excreta contains more vitamin B than corn or oats. The consumption of feces by rats on diets low in vitamin B may result in significant error.

Hauge, S. M., and Carrick, C. W.

1926

A Differentiation Between the Water-Soluble Growth-Promoting and Antineuritic Substances

Jour. Biol. Chem., 69, p. 403.

Reports that the antineuritic vitamin and the water-soluble growth-promoting vitamin are not identical, although they may occur in the same food.

Mitchell, H., and Carmon, G. G.

1926

Effect of Excessive Amount of Vitamin B on the Basal Metabolism of Rats of Different Ages

Am. Jour. Physiol., 76, p. 385.

Reports that the ingestion of amounts of vitamin B in excess of the minimum requirements for growth and continued well-being does not benefit an animal.

Concentrated Antineuritic Vitamin Prepared
from Brewer's Yeast

Jour. Biol. Chem., 67, p. 593.

States a method for preparing a concentrated antineuritic vitamin from brewer's yeast.

Sherman, H. C., and Burton, G. W.

1926

Effect of Hydrogen Ion Concentration Upon the
Rate of Destruction of Vitamin B upon Heating

Jour. Biol. Chem., 70, p. 639.

Reports that oxidation has no effect on the destruction of vitamin B. The vitamin is destroyed either by hydrolysis or intramolecular rearrangement, and destruction is catalyzed by OH ions.

Macy, I. G., Outhouse, J., Graham, A., and
Long, M. L.

1927

Human Milk Studies

Jour. Biol. Chem., 73, p. 189.

States that the average healthy mother produces a milk that is exceedingly low in vitamin B. Food materials rich in this vitamin should be a prominent part in the diet of pregnant and lactating women.

Miller, H. G.

1927

Vitamin B Requirements for Successful Reproduction and Rearing of the Young

Am. Jour. Physiol., 79, p. 255.

The percentage of vitamin B in a ration satisfactory for successful gestation and lactation need not be greater than in a ration supporting normal growth.

Human Milk Studies

Jour. Biol. Chem., 73, p. 203.

Reports that the thermostabile fraction of vitamin B is the limiting factor which prevents rats from attaining the average adult weight.

Quinn, M., Burtis, A., and Milner, J.

1927

Quantitative Studies of Vitamins A, B, and C
in Green Plant Tissues other than Leaves

Jour. Biol. Chem., 73, p. 557.

Finds that vitamin B is present in string beans and green peppers as much as in cabbage and lettuce, but not so much as in spinach.

Salmon, W. D.

1927

On the Existence of Two Active Factors in the
Vitamin B Complex

Jour. Biol. Chem., 73, p. 483.

Vitamin B is a complex of two or more active substances. A fuller's earth fraction which prevented experimental beriberi or polyneuritis of pigeons and rats but which did not induce growths of rats was prepared. Suggests that the term "vitamin B" be retained to designate the complex, and that the beriberi-preventing factor (anti-neuritic) be designated as "vitamin B-P".

Sherman, H. C., and MacArthur, E. H.

1927

A Quantitative Study of the Determination
of Vitamin B

Jour. Biol. Chem., 74, p. 107.

Reports that larger animals made smaller gains and that male rats made larger gains than females, indicating a higher vitamin B requirement for females.

Sherman, H. C., and Gloy, O. H. M.

1927

Vitamin B Determination and Requirement with
Special Reference to Protein Intake

Jour. Biol. Chem., 74, p. 117.

Finds that vitamin B requirement influences protein intake but in various ways and not directly.

Sherman, H. C., and Axtmayer, J. H.

1927

A Quantitative Study of the Problem of the
Multiple Nature of Vitamin B

Jour. Biol. Chem., 75, p. 207.

Reports that vitamin F (antineuritic vitamin B) is heat labile and that vitamin G (growth-promoting vitamin B) is heat stable. States that whole wheat is richer in vitamin F than in vitamin G and that milk is richer in vitamin G than in vitamin F.

Smith, H. P.

1927

Gastric Motility in Vitamin B Deficiency
in the Dog

Am. Jour. Physiol., 80, p. 485.

Finds that dogs which have lost their appetite for vitamin B deficient diets and showing initial symptoms of beriberi have normal types of gastric hunger peristalsis.

Sure, B.

1927

Dietary Requirements for Reproduction

Jour. Biol. Chem., 74, p. 55.

States that requirements for normal mammary gland function are considerably greater than that for optimum growth.

Bechdel, S. I., Honeywell, H. E., Dutcher, R., 1928
and Knutsen, M. H.

Synthesis of Vitamin B in the Rumen of the Cow

Jour. Biol. Chem., 80, p. 231.

Reports that vitamin B complex is produced in the rumen of the cow by bacterial fermentation.

Evans, H. M., and Burr, G. O. 1928

The Amount of Vitamin B Required During Lactation

Jour. Biol. Chem., 76, p. 263.

States that about five times the usual intake of vitamin B is required during lactation when yeast is the only source. If the antineuritic vitamin B is given additional vitamin is necessary and this vitamin is the growth-promoting vitamin B and not the antineuritic vitamin B.

Evans, H. M. 1928

The Effect of Inadequate Vitamin B upon Sexual Physiology in the Male

Jour. Nutrition, 1, p. 1.

Reports that deficiency in vitamin B does not effect the anatomical and functional integrity of the male germ cell but it decreases sex interest.

Evans, H. M., and Burr, G. O. 1928

A New Differentiation Between the Antineuritic Vitamin B and the Purely Growth-Promoting Vitamin B

Jour. Biol. Chem., 77, p. 231.

A new differentiation was secured between the antineuritic vitamin B and the growth-promoting vitamin B. Tikitiki, the dilute alcoholic extract of white rice polishings made in the Philippines is almost lacking in the growth-promoting vitamin B.

Hunt, C. H.

1928

The Complex Nature of Vitamin B as Found in
Wheat and Corn

Jour. Biol. Chem., 78, p. 83.

Finds that wheat and corn contain almost the same amount of vitamins F and G, but they are richer in vitamin F and in vitamin G. Vitamin B complex consists of at least two vitamins: vitamin F, which is the antineuritic factor, and vitamin G which is the antipellagric factor.

Hunt, C. H.

1928

Further Evidence of the Complex Nature of
Vitamin B

Jour. Biol. Chem., 79, p. 723.

Claims there is a new vitamin resident or a catalyst in the yeast residue, and possibly in the fuller's earth residue.

Levene, P. A.

1928

The Concentration of Vitamin B

Jour. Biol. Chem., 79, p. 465.

On the concentration and the separation of the two components of vitamin B.

Salmon, W. D., Guerrant, N. B., and Hays, I. M. 1928

The Effect of Hydrogen Ion Concentration Upon
Adsorption of the Active Factors of Vitamin B Com-
plex by Fuller's Earth

Jour. Biol. Chem., 80, p. 91.

States that the more acid, the more "P-P" factor adsorbed. More of the "B-P" factor is adsorbed at a pH of 4.0. Fuller's earth is more efficient for adsorbing "B-P" factor than the "P-P" factor.

Salmon, W. D., Guerrant, N. B., and Hays, I. M. 1928

On the Existence of Two Active Factors in the
Vitamin B Complex II

Jour. Biol. Chem., 76, p. 487.

Reports that extract of velvet bean leaves produced no growth alone but with the "B-P" factor, prevented pellagra-like symptoms and accelerated growth. States that there is a relation between the amount of "B-P" factor and the rate of growth.

Sure, B.

1928

A Detailed Study of the Role of Vitamin B
in Anorexia in the Albino Rat

Jour. Nutrition, 1, p. 49.

States that anorexia can be attributed to deficiency in vitamin B.

Sure, B.

1928

Vitamin Requirements of Nursing Young

Jour. Nutrition, 1, 155.

Nursing young need approximately 100 times as much vitamin B as vitamins A and D for continuous growth during the nursing period.

Sure, B.

1928

Dietary Requirements for Fertility and Lactation

Jour. Biol. Chem., 76, p. 673.

Finds that yeasts from various sources vary considerably in their biological value as a source of vitamin B for lactation.

Sure, B.

1928

Dietary Requirements for Fertility and Lactation

Jour. Biol. Chem., 76, p. 685.

Reports that vitamin B dissipates 60% by nursing mother in the metabolism of transfer to the milk. The large requirements of vitamin B for lactation is due to inability of the nursing mother to secrete vitamin B quantitatively in the milk.

Sure, B.

1928

Dietary Requirements for Fertility and Lactation

Jour. Biol. Chem., 80, p. 289.

Finds that copper has no supplementary value to a vitamin B concentrate for lactation.

Sure, B.

1928

Dietary Requirements for Fertility and Lactation

Jour. Biol. Chem., 80, p. 297.

Finds that from the standpoint of lactation rice polishings prove abundant in vitamin B and deficient in vitamin F. Larger amounts of B₁ and B₂ are essential for lactation than for growth.

House, M. C., Nelson, P., Haber, E. S.

1929

The Vitamin A, B, and C Content of Artificially versus Naturally Ripened Tomatoes

Jour. Biol. Chem., 81, p. 495.

Reports that the amount of vitamin B present in artificially and naturally ripened tomatoes is not altered.

Heat and Ultra-Violet Irradiation as a Means of Differentiating Vitamins B and G in Yeast

Jour. Biol. Chem., 83, p. 493.

States that irradiation cannot be relied upon completely to destroy growth-promoting factors of yeast other than the antineuritic factor.

Kon, S. K.

1929

On the Carbon:Nitrogen (C/N) Ratio in the Urine of Rats Deprived of One or Both Factors of the Vitamin B Complex

Jour. Nutrition, 1, p. 467.

Reports that the heat stable component of vitamin B complex shows an increased carbon:nitrogen ratio. Concludes that the heat stable factor is in some way linked with the metabolic processes of the body.

Pierce, H. B., Osgood, H. S. and Polansky, J. B. 1929

The Absorption of Glucose from the Alimentary Tract of Rats Deprived of the Vitamin B Complex

Jour. Nutrition, 1, p. 247.

Finds that functional activity of the gastrointestinal tract is dependent to some extent upon the presence of vitamins A and B in the diet.

Seidell, A.

1929

Further Progress Towards the Isolation of the Antineuritic Vitamin (B) from Brewer's Yeast

Jour. Biol. Chem., 82, p. 633.

A method is given which represents a purification of antineuritic material more than 100 times that of dried brewer's yeast.

Sure, B., Kik, M ., and Walker, D. J.

1929

Vitamin Requirements of Nursing Young

Jour. Biol. Chem., 82, p. 287.

Reports that nursing houn^g of the albino rat suffering from vitamin B complex deficiency develop anhydremia and show marked disturbances in hemato-poietic function.

Sure, B., Kik, M ., and Walker, D. J.

1929

The Effect of Avitaminosis on Hematopoietic Function

Jour. Biol. Chem., 83, p. 387.

States that a deficiency in vitamin B complex shows a reduction in the concentration of serum proteins, and in the final stages shows a marked rise in the concentration of hemoglobin and erythrocytes. There is a loss of water in blood serum.

Sure, B., and Smith, M. E.

1929

Effect of Vitamin Deficiencies on Carbohydrate Metabolism

Jour. Biol. Chem., 82, p. 287.

Finds that hypoglycemia developed in vitamin B deficient rats at a stage before loss of body weight occurred. Anhydremia and hemotopöietic disturbances also develop.

Sure, B., and Smith, M. E.

1929

The Effect of Vitamin Deficiencies on Carbohydrate Metabolism

Jour. Biol. Chem., 84, p. 727.

Reports that uncomplicated vitamin B deficiency results in a rise in reducing non-sugars, a reduction of water intake, hypoglycemia in later stages and acidosis in terminal stages.

The Effect of pH Control in the Autoclaving of Yeast with Respect to the Vitamin B Factors

Jour. Biol. Chem., 83, p. 321.

States that B₁ is destroyed in high acid concentration and that B₂ is destroyed in high alkaline concentration.

Axtmayer, J. H.

1930

A Study of the Vitamin B Complex of Red Kidney Beans and Polished Rice

Jour. Nutrition, 2, p. 353.

Reports that red kidney beans are richer in vitamin B₁ than vitamin B₂ (G) and that polished rice is deficient in both factors of the vitamin B complex.

Cowgill, G. R., Rosenberg, H., and Rogoff, J. 1930

The Anorexia Characteristic of So-called Vitamin B Deficiency : Is it Due to a Lack of the Antineuritic Factor, the Antipellagra Substance, or Both?

Am. Jour. Physiol., 93, p. 641.

Claims that the anorexia characteristic of so-called vitamin B deficiency is indicative of a lack primarily of the antineuritic principle (B₁, vitamin F).

Cowgill, G. R., Rosenberg, H., and Rogoff, J. 1930

The Effect of Administration of Large Amounts of Water on the Time Required for Development of the Anorexia Characteristic of a Deficiency of the Vitamin B Complex

Am. Jour. Physiol., 95, p. 537.

States that the administration of large amounts of water with a vitamin B deficient diet in dogs shortens the period required for the appearance of anorexia which does not support the toxemia theory.

Eddy, W. H., Gurin, S., and Keresztesy, J. 1930

The Williams-Waterman Vitamin B₃

Jour. Biol. Chem., 87, p. 729.

Reports that B₃ is more heat-labile than B₁. Finds that yeast, whole grains, and malt are good sources of vitamin B₃, and that malt extract contains B₁ but not B₃ and that beef and beef liver contain B₃. Chicks require B₃ for growth even when fully supplied with B₁ and B₂.

Guerrant, N. B., and Salmon, W. D. 1930

The Stability of Vitamin G as Measured by its Growth-Stimulating Effect

Jour. Biol. Chem., 89, p. 199.

Finds that yeast, yeast extract, dry yeast lose growth-stimulating effect when heated and that gaseous oxygen through a hot concentrated yeast extract had little effect on the growth-stimulating properties.

Lepkovsky, S., Wood, C., and Evans, H. M. 1930

Glucose Tolerance in Avitaminosis Due to Low Antineuritic Vitamin B

Jour. Biol. Chem., 87, p. 239.

Reports that animals suffer a long period from vitamin B deficiency without appreciable lowering of their glucose tolerance and that the animals approaching a final breakdown from beriberi exhibit a poorer glucose tolerance than those having adequate vitamin B.

The Toxic Effect of Fish Liver Oils and The
Action of Vitamin B

Jour. Biol. Chem., 89, p. 437.

Finds that some cod liver oils produce symptoms similar to vitamin B deficiency and that the toxic effect of excess cod liver oil can be counteracted by feeding large amounts of yeast. Small doses of choline also produce symptoms indential with vitamin B deficiency.

Schelling, V.

1930

Observations in the Serum Calcium, Proteins,
and Inorganic Phosphorus in Experimental Vitamin B
Deficiency and Inanition

Jour. Biol. Chem., 89, p. 575.

Reports that there is no remarkable decrease in calcium during the vitamin B-free period, and that there is no noteworthy change in the proteins and inorganic phosphorus.

Williams, R. R., Waterman, R. E., and Gurin, S. 1930

The Jansen and Donath Procedure for the Iso-
lation of Antineuritic Vitamin

Jour. Biol. Chem., 87, p. 559.

Finds that Jansen and Donath's crystals possess antineuritic properties and the empirical formula is $C_6H_{10}H_2O.HCl$.

Williams, R. J., and Roehm, R. R.

1930

The Effect of Antineuritic Vitamin Preparation
on the Growth of Yeasts

Jour. Biol. Chem., 87, p. 581.

Report that a preparation made by Williams and Waterman from the fractions discarded in the Jansen-Donath acetone-alcohol prodedure has an activity for yeast twice as great as that of the crystalline vitamin.

Evidence for the Presence of a Third Factor
in the Vitamin B Complex of Yeast

Jour. Biol. Chem., 89, p. 275.

States that B₁ and B₂ are not sufficient for optimum growth and health in rats and that the residue of the water-alcohol-soluble fractions of yeast contains a growth promoting principle necessary for normal growth. This third factor is insoluble in water and alcohol and is thermostable.

Cowgill, G. R., Rosenberg, H., and Rogoff, J. 1931

Studies in the Physiology of Vitamins

Am. Jour. Physiol., 97, p. 589.

States that the vitamin B requirement per unit of tissue mass is proportional to the metabolism of that mass.

Francis, L., Smith, A., and Moise, T. S. 1931

Diet and Tissue Growth

Am. Jour. Physiol., 97, p. 210.

Finds that the increase of the size of the kidney of the rat, due to a high protein ration, is neither lessened nor prevented by the use of any amount of vitamins B, G and undifferentiated B B employed.

Freudenberg, W., and Cerecedo, L. R. 1931

Studies in the Antineuritic Vitamin

Jour. Biol. Chem., 94, p. 207.

Reports that an antineuritic concentrate is obtained from rice polishings and that this concentrate promotes growth in mice.

The Influence of the Ration of the Cow Upon
the Vitamin B and Vitamin G Content of Milk

Jour. Biol. Chem., 92, p. 631.

Finds that milk from cows on early pasture
gives a higher vitamin G content than milk from
cows on dry feed or overmature pasture.

Further Evidence of the Complex Nature of
Vitamin B

Jour. Biol. Chem., 90, p. 279.

States that vitamin B (antineuritic) is heat
labile in alkaline and acid and the vitamin G (anti-
pellagic) is thermostabile under all conditions and
the third factor is thermolabile in alkaline medium
under pressure.

The Vitamin B and G Requirements of Lactation

Jour. Nutrition, 4, p. 127.

Reports that both B and G must be present to
obtain milk production, but lactation is more succ-
essful is vitamin G is fed in larger quantities than
the amount given for growth. Added vitamin G is
more important.

Are the Williams-Waterman Vitamin B₃ and
Randoin-Lecoq Nutritional Vitamin the Same?

Jour. Biol. Chem., 91, p. 671.

The Williams-Waterman vitamin B₃ and Randoin-
Lecoq nutritional vitamin are the same.

The Effect of Partial Depletion of Vitamin B
Complex Upon Learning Ability in Rats

Jour. Nutrition, 4, p. 507.

Reports that early partial depletion of vitamin B complex is detrimental to higher nervous function as measured by maze learning ability and that the offspring of depleted animals can attain the normal level of learning ability if brought up on rich diet of vitamin B complex.

Sherman, H. C., and Sandels, A.

1931

Further Experimental Differentiation of Vitamin
B and G

Jour. Nutrition, 3, p. 395.

States that vitamin B has a specific relation to maintenance of appetite and prevention of polyneuritis in rats and that vitamin G is pellagra-preventing. Growth requires both B and G.

Sherman, H. C., and Whitsitt, M. L.

1931

A Study of The Effect of Nitrous Acid Upon
Components of the Vitamin B Complex

Jour. Biol. Chem., 90, p. 153.

Reports that vitamin B is susceptible to action of nitrous acid, which suggests it has a nitrogenous base and that vitamin G behaves more like a neutral organic substance.

Supplee, G. C., Kahlenberg, O., and Flanigan, G. 1931

The Growth-Promoting Properties (Vitamin B
Complex) of The Soluble Concentrated Water-Soluble
Portion of Milk

Jour. Biol. Chem., 93, p. 705.

Finds that the growth-promoting and antipellagric factors are in high concentration in milk and that there is less of the antineuritic principle.

Sure, B., Smith, M. E., Kik, M. C., and Walker, D. J.

1931

The Specific Effect of Vitamin B on Lactation, Growth, and Blood Chemistry

Jour. Biol. Chem., 92, p. viii.

Reports that uncomplicated vitamin B has a direct relation to lactation and that there is a slight increase in non-protein nitrogen of the blood. Also finds that vitamin B complex gives an increase in growth and cholesterol, lecithins, fatty acids, and iodine number of the blood.

Sure, B., and Walker, D. J.

1931

Dietary Requirements for Fertility and Lactation

Jour. Biol. Chem., 91, p. 69.

States that vitamin B, in addition to influencing food consumption, plays a specific role in lactation, unrelated to the plane of nutrition.

Himwich, H., Goldfarb, W., and Cowgill, G. R.

1932

Studies in the Physiology of Vitamins

Am. Jour. Physiol., 99, p. 689.

Claims that the vitamin requirement is proportional to the calorie factor.

Moore, C., Plymate, H., Andrew, B., and White, V.

1932

Studies in the B Vitamins

Am. Jour. Physiol., 102, p. 573.

Reports that the litter size of rats was greatest when a 10% yeast diet was given.

Studies in the B Vitamins

Am. Jour. Physiol., 102, p. 605.

States that a condition of pylorospasm was brought about by the lack of vitamin B₁, and a complete cure was occasioned by treatment with a vitamin B₁ preparation.

Moore, C., Plymate, H., and Andrew, B. J.

1932

Studies in the B Vitamins

Am. Jour. Physiol., 102, p. 581.

States that a third factor present in vitamin B complex is necessary for continued growth in the rat.

Moore, C., Plymate, H., and Andrew, B. J.

1932

Studies in the B Vitamins

Am. Jour. Physiol., 102, p. 598.

Find that there is no relation between myelin degeneration in the peripheral nerves of rats and vitamin B deficiency.

Moore, C., Plymate, H., and White, V.

1932

Studies in the B Vitamins

Am. Jour. Physiol., 102, p. 593.

Reports that vitamin B bears a relation to the number in the litter of rats and the mortality of that litter.

The Relative Quantities of the Heat-Stable and Heat Labile Fractions of Vitamin B in Raw and Evaporated Milk

Jour. Nutrition, 5, p. 307.

Reports that commercial evaporation of cow's milk destroys about one-sixth to one-fifth of the antineuritic heat-labile fraction and that there is no identifiable destruction of the heat-stable, growth-promoting fraction.

Sure, B., Kik, M. C., and Smith, M. E.

1932

The Specific Effect of Vitamin B on Growth

Jour. Nutrition, 5, p. 155.

States that vitamin B stimulates growth unrelated to food intake and it produces growth by increasing the plane of nutrition through a stimulation of the appetite.

Sure, B., and Smith, M. E.

1932

Dietary Requirements for Fertility and Lactation

Jour. Nutrition, 5, p. 147.

Reports that in addition to stimulating the appetite, vitamin B exerts a specific influence on lactation, unrelated to the food and water intake.

Cowgill, G. R., and Palmieri, M. L.

1933

Studies in the Physiology of Vitamins

Am. Jour. Physiol., 104, p. 484.

States that the administration of large volumes of water by mouth to pigeons is without appreciable influence on the duration of the period required for the development of anorexia due to lack of vitamin B.

Studies in the Physiology of Vitamins

Am. Jour. Physiol., 105, p. 146.

Finds that the vitamin B requirement of pigeons is greater in hyperthyroidism than under "normal" condition and that there is a relation between the amount of vitamin B required for the maintenance of body weight and the metabolism of the organism.

Evans, H. M., and Lepkovsky, S.

1933

The Sparing Action of Fat on Vitamin B

Jour. Biol. Chem., 99, p. 235.

Reports that the sparing action of fat on vitamin B cannot be ascribed to an interaction in the alimentary canal between these two substances.

Hendricks, W. A.

1933

The Relation of Vitamin B Requirement to Metabolism

Am. Jour. Physiol., 105, p. 678.

States that the vitamin B requirement is proportional to the metabolism, multiplied by a factor correcting for age.

Hogan, A. G., and Richardson, L. R.

1933

Effect of Ultra-Violet Irradiation on the Vitamin B Complex

Jour. Biol. Chem., 100, p. lv.

Reports that vitamin B irradiated through ordinary window-glass showed little or no loss in activity.

Lewis, R. C., and Rymer, M. R.

1933

Further Evidence Concerning the Multiple
Nature of the Vitamin B Complex of Yeast

Jour. Biol. Chem., 100, p. lxiii.

States that the growth-promoting factor is
neither the vitamin B factor nor the vitamin G
factor in yeast.

McCay, C. M.

1933

An Insect Test for Vitamin B Fractions

Jour. Biol. Chem., 100, p. lxviii.

Reports that cockroach (*B lattela germanica*)
reacts to both deficiencies in vitamin B factors and
in amino acids.

Miller, C. D., and Abel, M. G.

1933

Adsorption of Vitamin B (B_1) by Plant Tissue

Jour. Biol. Chem., 100, p. 731.

Reports that Chinese cabbage (*Brassia chinensis*)
loses 50% of original vitamin B content when pickled
with salt for three days, but when pickled in a paste
of salt and rice bran, vitamin B content is increased
to four times its original volume.

Sandberg, M., and Holly, O. M.

1933

On the Influence of Vitamin B and of Iodine
on the Calcium and Phosphorus Metabolism of Rabbits
with Hyperplastic Thyroids

Jour. Biol. Chem., 99, p. 547.

States that vitamin B and iodine causes an
increase in calcium excretion and a change in the
ratio of the calcium and phosphorus retention.

Sherman, H. C., and Derbigny, I. A.

1933

Studies on Vitamin G (B_2) With Special Reference
to Protein Intake

Jour. Biol. Chem., 99, p. 165.

Finds that protein in the diet causes rats
to be less severely affected with pellagra.

Walker, R., and Nelson, E. M.

1933

Fresh and Dried Yeast as Sources of Vitamin B_1

Am. Jour. Physiol., 103, p. 25.

Reports that dried yeast cakes contain one-
half as much vitamin B_1 as fresh yeast cakes.

Bender, R. C., Flanigan, G. E., and Supplee, G. 1934

A Vitamin B Deficient Ration

Jour. Nutrition, 8, p. 357.

Gives a vitamin B deficient ration.

Block, R. J., and Farquhar

1934

Studies on Vitamin G (B_2)

Jour. Biol. Chem., 105, p. 643.

Reports that vitamin G has growth-promoting
properties and that there is no support to view of
a relationship of vitamin G and the substance effective
in the treatment of pernicious anemia.

Daniel, E. P., and Munsell, H. E.

1934

Behavior of Rats of Different Ages on a Vitamin G Deficient Diet

Jour. Nutrition, 7, p. 117.

Finds that vitamin G deficiency is more evident as age increases and that the older the animal the greater percent weight loss.

Day, P. L., and Langston, W. C.

1934

Further Experiments with Cataract in Albino Rats Resulting From the Withdrawal of Vitamin G (B₂) from the Diet

Jour. Nutrition, 7, p. 97

Reports that the growth limiting and the cataract-preventative factors are identical.

Donelson, E. G., and Macy, I.G.

1934

Human Milk Studies

Jour. Nutrition, 7, p. 231.

States that the biological potency of breast milk can be enhanced by the addition of a concentrated source of the vitamin B complex to the average diet and that mothers experience less fatigue and more of a feeling of well being.

Grollman, A., and Firor, W. M.

1934

Studies on the Adrenal

Jour. Nutrition, 8, p. 569.

Reports that adrenal cortical hormone does not replace vitamin B or G in experimental avitaminosis.

Some Effects of the Composition of the Diet on the Vitamin B and the Vitamin G Requirement of the Growing Rat

Jour. Nutrition, 8, p. 397.

States that a protein diet does not affect the vitamin B and G requirement but that mineral salts increased the vitamin B requirement and that fats decreased the vitamin B requirement.

Hogan, A. G., and Richardson, L. R.

1934

Irradiated Vitamin B Complex and Dermatitis

Jour. Nutrition, 8, p. 385.

States that cornstarch contains the factor that prevents dermatitis and that approximately 75% of the antidermatitic activity is destroyed by irradiation.

Keenan, J. A., and Kline, O. L.

1934

Studies on the Stability of Vitamin B₁, B₂, and B₄

Jour. Biol. Chem., 105, p. xlv.

States that vitamin B₁ is heat-labile, vitamin B₂ is heat-labile, vitamin B₄ is heat-labile and that vitamin B₁ is heat-stable at 120° C. in dry medium,

Kremmerer, A., and Steenbock, H.,

1934

A Study of the Sparing Action of Fats on the Vitamin B Content of Animal Tissues

Jour. Biol. Chem., 103, p. 353.

Reports that there is less vitamin B in the muscles when the vitamin B is deficient.

The Utilization of Energy Producing Nutrient and Protein as Affected by Individual Nutrient Deficiencies

Jour. Nutrition, 8, p. 295.

Reports that vitamin B deficiency is indicated by a decrease in appetite, decrease in the quantity of fat and energy gained, lower body temperature, slight increase in the digestibility of protein and an increased energy outgo.

Prickett, C. O. 1934

The Effect of a Deficiency of Vitamin B₁ Upon the Central and Peripheral Nervous Systems of the Rat

Am. Jour. Physiol., 107, p. 459.

Reports that the central rather than the peripheral nervous system is affected by a deficiency in vitamin B₁.

Supplee, G. C., Bender, R. C., and Flanigan, G. 1934

The Vitamin B Supplementation of Milk

Jour. Nutrition, 8, p. 365.

Finds that dry milk plus vitamin B shows a greater growth promoting property than milk not containing vitamin B supplement.

Sure, B., and Smith, M. E. 1934

Hyperthyroidism and Nutrition

Jour. Nutrition, 8, p. 547.

Reports that the requirement of vitamin B is greater in hyperthyroidism than under normal conditions and the toxicity of thyroxin greatly diminishes by the presence of vitamin B.

The Effect of Inositol, Crystalline Vitamin B,
and Pantothenic Acid on the Growth of Different
Strains of Yeast

Jour. Biol. Chem., 105, p. xcix.

Finds that there is no single substance that is wholly responsible for yeast growth stimulation, but that pantothenic acid is more outstanding and that the crystalline vitamin B has very little effect.

Ammerman, M., and Waterman, R. E.

1935

Studies of Crystalline Vitamin B

Jour. Nutrition, 10, p. 25.

States the dose of crystalline vitamin B hydrochloride under standard established by response.

Booher, L. E.

1935

Further Studies on the Concentration and
Chemical Nature of Vitamin G

Jour. Biol. Chem., 107, p. 591.

States the physical properties of vitamin G.

Booher, L. E., Blodgett, and Page, J. W.

1935

Investigations of the Growth-Promoting Properties
of Vitamin G Concentrates

Jour. Biol. Chem., 107, p. 599.

Reports that vitamin G and vitamin B do not constitute the whole of the vitamin B complex.

Brodie, J. B., and MacLeod, F. L.

1935

Quantitative Experiments on the Occurrence of Vitamin B in Organs

Jour. Nutrition, 10, p. 179.

States that the amount of vitamin B in the body of the rat may be changed within certain limits by varying the amount of vitamin B in the diet.

Day, P. L.

1935

Blood Sugar in Rats in Which Cataract was Produced by a Vitamin G-Deficient Diet and by a Lactose-Containing Diet

Jour. Biol. Chem., 109, p. xxvi.

Finds that abnormal carbohydrate metabolism can hardly be an etiological factor in the formation of cataract resulting from vitamin G deprivation.

Elvehjem, C. A., and Coehn, E.

1935

The Non-Identity of Vitamin B₂ and Flavins

Jour. Biol. Chem., 107, p. 709.

Reports that flavins are inactive in the cure of pellagra.

Elvehjem, C. A., Sherman, W. C., and Arnold, A. 1935

The Vitamin B (B₁) Content of Animal Tissues

Jour. Biol. Chem., 109, p. xxix.

Finds that pork muscle, heart muscle, and kidney are fairly rich in vitamin B and that beef muscle, mutton muscle, brain, and lung are very low in vitamin B content.

Evans, H. M., Lepkovsky, S., and Murphy, E. 1935

The Sparing Action of Fat on Vitamin B

Jour. Biol. Chem., 107, p. 429.

States that ~~fore~~ fat to exert its greatest sparing action on vitamin B, protein and vitamin G must be high.

Evans, H. M., Lepkovsky, S., and Murphy, E. 1935

The Sparing Action of Fat on Vitamin B

Jour. Biol. Chem., 107, p. 439.

Reports that various fats vary in their ability to spare vitamin B.

Evans, H. M., Lepkovsky, S., and Murphy, E. 1935

The Sparing Action of Fat on Vitamin G

Jour. Biol. Chem., 107, p. 443.

Reports that fats do not exert a beneficial effect on diets in which vitamin G is low or absent.

Griffith, W. H. 1935

Studies on Growth

Jour. Nutrition, 10, p. 675.

Reports that young rats on a vitamin B deficient ration were depleted of most of the vitamin B originally present in the tissues and that a corresponding loss of vitamin G did not occur with a G-deficient ration.

The Nutritive Value of Fungi

Jour. Nutrition, 9, p. 691.

Reports that molds contain vitamin B.

Guerrant, N. B., Dutcher, R. A., and Tomey, L. 1935

The Effect of the Type of Carbohydrate on the
Synthesis of the B Vitamins in the Digestive Tract
of the Rat

Jour. Biol. Chem., 110, p. 233.

Reports that vitamin B is formed in the lower
digestive tract of the rat and that live yeast cells
are found in the cecum and are believed to be the
specific agents for the elaboration of B vitamins.

Hamilton, T. S., and Mitchell, H. H.

1935

A Modification of the Sherman Method of
Studying the Multiple Nature of the Vitamins, with
an Application to Vitamin G

Jour. Nutrition, 10, p. 117.

Reports that there is no evidence of the
multiple nature of the G fraction.

Halliday, N.

1935

Further Investigations Concerning the New
Vitamin B Growth-Promoting Factor for Rats, Found
in Rats

Jour. Biol. Chem., 106, p. 29.

Reports that the wheat germ is the richest
source for the growth-promoting factor.

Itter, S., Orent, E. R., and McCollum, E. V. 1935

An Effective Method of Extracting Vitamin B

Jour. Biol. Chem., 108, p. 571.

Gives a method for the extraction of vitamin B.

Itter, S., Orent, E. R., and McCollum, E. V. 1935

The Possible Role of the Sulfhydryl Group in
Vitamin B₂ Deficiency

Jour. Biol. Chem., 108, p. 585.

States the possible role of the sulfhydryl
group in vitamin B₂ deficiency.

Kienan, J. A., Kline, O. L., Elvehjem, C. A., 1935
and Hart, E. B.

The Stability of Vitamins B (B₁), G (B₂) and
B₄

Jour. Nutrition, 9, p. 63.

Finds that vitamin B₄ is similar to vitamin B
(B₁).

Koehn, C. J. Jr., and Elvehjem, C. A. 1935

Studies on Vitamin G (B₂) and its Relation to
Canine Black Tongue

Jour. Nutrition, 11, p. 67.

Reports that fractions prepared from liver
extract, rich in vitamin G (B₂), with the heptoflavin
removed through adsorption on fuller's earth are very
active in the cure of black tongue in dogs.

Lepkovsky, S., Popper, W., Jr., and Evans, H. 1935

The Preparation of Crystalline Vitamin G
Jour. Biol. Chem., 109, p. liv.

Gives a method for the preparation of crystalline vitamin G.

Morgan, A. F., Hunt, M. J., and Squier, M. 1935

The Vitamin B and G Content of Prunes
Jour. Nutrition, 9, p. 395.

Finds that dried California (French) prune flesh contains 266 Sherman units per 100 Gm. of vitamin G (B₂).

Poe, C. F., and Gambill, E. L. 1935

The Vitamin G Content of Home-Canned Tomato Juice

Jour. Nutrition, 9, p. 119.

Finds that home-canned tomato juice contains .21 Sherman units per cc. of vitamin G.

Supplee, G. C., Ansbacher, S., and Bender, R. 1935

Photochemical Phenomena Involved in Vitamin G (B₂) Studies

Jour. Biol. Chem., 110, p. 365.

States that the lactoflavin gives a yellow-green florescence and when exposed to light gives a blue florescence and has lost its growth-promoting property.

Sure, B., Kik, M. C., and Buchanan, K. S. 1935

Influence of Vitamin B Deficiency on Tryptic and Ereptic Digestion of Casein

Jour. Biol. Chem., 108, p. 19.

Reports that there is no disturbance in either tryptic or ereptic digestion when the rat is deficient only in vitamin B complex, or vitamin B.

Sure, B., Kik, M. C., and Buchanan, K. S. 1935

Influence of Vitamin B Deficiency on Efficiency of Pancreatic Lipase and Esterase

Jour. Biol. Chem., 108, p. 27.

Reports that there is a marked decrease in the efficiency of digestion of pancreatic lipase and esterase with vitamin B complex deficiency and that there is a decrease in pancreatic lipase activity with uncomplicated vitamin B deficiency.

Whipple, D. V. 1935

Vitamins A, D, and B in Oysters -- Effect of Cooking upon Vitamins A and B

Jour. Nutrition, 9. p. 163.

Finds that oysters are an excellent food source of vitamin B (B_1) and contains 1.5 Sherman units of vitamin B (B_1) perGm.

Whipple, D. V., and Church, C. F. 1935

The Relation of Vitamin B (B_1) to Fat Metabolism

Jour. Biol. Chem., 109, p. xcvi.

Finds that fat is essential for the production of the anti-beriberi factor in the gastro-intestinal tract of the vitamin B-deficient rat.

The Oxygen Uptake and Composition of The Skin
of Rats in Vitamin G Deficiency

Jour. Biol. Chem., 116, p. 641.

Finds that the oxygen consumption of the skin of rats in vitamin G deficiency is at a much lower level and that the vital activity in the skin is lower in this deficiency and that the fat content of the skin decreases.

Bethke, R. M., Record, P. R., and Wilder, F. 1936

The Effect of The Ration of The Hen on The
Vitamin G Content of Eggs With Observations on The
Distribution of Vitamin B and G in Normal Eggs

Jour. Nutrition, 12, p. 309.

Reports that the ration of the hen affects the vitamin G content of the eggs produced and that vitamin B is present in the egg yolk and not in the egg white and that vitamin G is found in both the white and the yolk.

Dann, F. P.

1936

Vitamin B Assay Using Rat Curative Method
With Modified Diets and Oral Administration of Addenda

Jour. Nutrition, 12, p. 461.

Gives a vitamin B assay.

Kline, O. L., Bird, H. R., Elvehjem, C. A., and 1936
Hart, E. B.

The Distribution of Vitamin B₄ in Some Plant
and Animal Products

Jour. Nutrition, 12, p. 455.

Reports that dried grass, peanuts, wheat germ, pork brain and pork kidney are found to be good sources of vitamin B₄, and that the grains tested were relatively poor sources, but white corn and hulled oats are superior to wheat and yellow corn.

A Quantitative Study of The Utilization and Retention of Vitamin B by Young Children

Jour. Nutrition, 12, p. 597.

Reports that the optimum requirement of vitamin B by young children is estimated to be 20 units per kilogram of body weight, or about 40 Chase-Sherman units per kilogram per day.

Lepkovsky, S., Jukes, T. H., and Krause, M. 1936

The Multiple Nature of The Third Factor of The Vitamin B Complex

Jour. Biol. Chem., 115, p. 557.

Finds that one component prevented or cured acute dermatitis in rats whereas another component prevented or cured chick dermatitis and that both components were needed by the rat for growth.

Schlutz, F. W., and Knott, E. M. 1936

The Use of a 10-Day Period for The Assay of Vitamin B by Rat Growth Technique

Jour. Nutrition, 12, p. 583.

Suggests that the quantity of vitamin B causing 1 Gram of gain, when the rate of gain is limited to 1 to 2 Grams per day be used as a unit since it is comparable to the minimum curative dose defined by Ammerman and Waterman.

Sherman, W. C., and Elvehjem, C. A. 1936

In Vitro Action of Crystalline Vitamin B₁ on Pyruvic Acid Metabolism in Tissues from Polyneuritic Chicks

Am. Jour. Physiol., 117, p. 142.

Reports the studies on the action of crystalline vitamin B₁ on pyruvic acid metabolism in tissues, in vitro, from polyneuritic chicks.

A Study of The Effect of Vitamin B and Iodine on The Weight, Iodine Content and Structure of The Thyroid Gland of The Rat

Jour. Nutrition, 13, p. 235.

States that vitamin B deficiency alone does not affect the size, structure, or iodine content of the thyroid gland of the rat but that some factor present in yeast which is lost when the yeast is autoclaved and which is not supplied by a vitamin B containing extract causes an increase in the iodine content and concentration of the thyroid.

Guerrant, N. B., Dutcher, R., and Brown, R. A. 1937

Further Studies Concerning The Formation of The B Vitamins in The Digestive Tract of The Rat

Jour. Nutrition, 13, p. 305.

Reports studies concerning the formation of the B vitamins in the digestive tract of the rat.

Halliday, N., and Evans, H. M.

1937

Dietary Production of the Syndrome of Deficiency of Vitamin B₆

Jour. Nutrition, 13, p. 458.

Gives a diet which shows vitamin B₆ deficiency.

Halliday, N., and Evans, H. M.

1937

On The Fractionation of The Vitamin B₂ Complex From Various Source Materials,

Jour. Biol. Chem., 118, p. 255.

Reports that induced growth without protection from dermatitis apparently indicates the presence of the filtrate factor separate from vitamin B₆.

The Determination of Vitamin B and G in Human Urine by The Rat-Growth Method

Jour. Nutrition, 13, p. 279.

Finds that when an excess of vitamin B, calculated by Cowgill's formula, is present in the diet, vitamin B can be detected in definite quantities in the urine, and that vitamin G is present in the normal urine tested in larger amounts than vitamin B.

Miller, C. D.

1937

Adsorption of Vitamin B by Plant Tissue (By Solanum Melongena Linn. and Raphanus Sativus var. Longipinnatus Bailey) When Pickled With Salt and Rice Bran

Jour. Nutrition, 13, p. 687.

Reports that plant tissues adsorb quantities of vitamin B when pickled with salt and rice bran.

Norris, E. R., Simeon, M. K., and Williams, H. B. 1937

The Vitamin B and Vitamin C Content of Marine Algae

Jour. Nutrition, 13, p. 425.

Reports that six of the seven algae tested were found to be good sources of vitamin B, and that species of Porphyra were found to be the richest source and that algae growing in the littoral zone or on the surface have higher vitamin C content than those from 5 to 10 fathoms depth.

Prebluda, H. J., and McCollum, E. V.

1937

A Chemical Reagent For The Detection and Estimation of Vitamin B₁

Jour. Biol. Chem., 119, p. lxxix.

Gives a chemical reagent which can be used for the detection and the estimation of vitamin B₁.

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