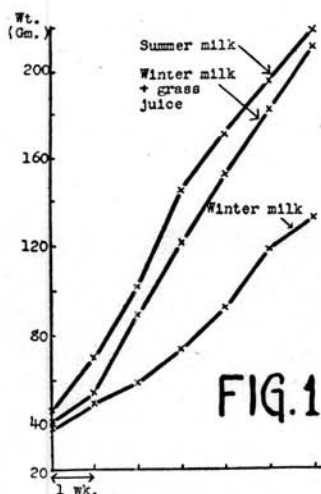


GRASS JUICE FACTOR IN THE YOUNG LEAVES OF CEREAL GRASS*

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Dried and powdered leaves of young grass have long been recognized in Europe as an important source of protein for animals. In this country, there has been recently a national wave of interest in the use of preparations of young leaves of cereal grasses as an article of human food. These preparations scarcely can compete with a properly prepared steak as a source of protein for human beings, but there is a much more significant reason why human beings should respectfully consider the nutritional possibilities of grass, since probably no other natural product contains such a rich supply of the various vitamins and other growth factors necessary for the maintenance of health. For example, young cereal grass leaves contain significant amounts of the following substances: Vitamin A, which is concerned with night blindness and certain skin diseases; Vitamin B complex, which is a group of probably 15 related vitamins concerned with pellagra and the activity of the auditory nerve; Vitamin B₁, known chemically as thiamin, which exhibits a great variety of physiological relationships concerning beriberi, heart function, lactation and various nervous disturbances; Vitamin B₂, chemically designated as riboflavin, which is a preventative for blindness caused by inflammation of the cornea and for certain skin ailments; Vitamin C, described by the chemists as ascorbic acid is necessary for the prevention of scurvy, pyorrhea, rheumatic fever, hemorrhage, cataract, insomnia, inflammation of the bone marrow and in addition aids the healing of wounds; Vitamin D, called calciferol, prevents rickets, nervous spasms, softening of the bones and acne; Vitamin E, alpha-tocopherol, prevents sterility, muscle weakness and various diseases caused by the degeneration of the nerves; Vitamin K which is intimately concerned with blood clotting and the consequent prevention of hemorrhage.



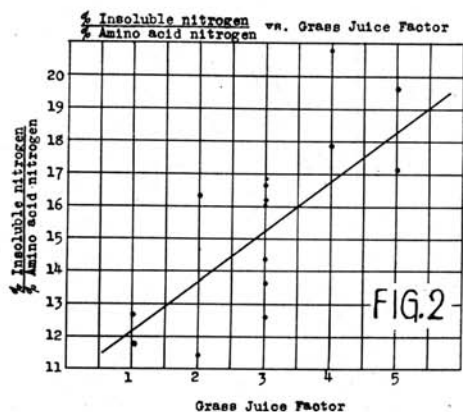
The effect of grass juice factor on the growth of rats.

While the leaves of young cereal grass contain all of the above substances important for human beings, there is also another important component known as the "grass juice factor". Kohler, Elvehjem and Hart (1) have described this component as a substance which is water soluble and heat labile which is important for the normal growth of rats and guinea pigs. Figure 1 shows some of the results of these authors. But as might be expected, this "grass juice factor" is important for other reasons than its effect on rats or guinea pigs. For instance, it is known to have a favorable influence on chickens, silver foxes, human beings and other animals. The complete physiology of this substance is not yet known and it is now the subject of study in many research laboratories.

At present, the only known procedure for the assay of this important growth substance is the observation of its effect on various test animals over a period of several weeks.

TABLE 1.—WHEAT SERIES

Plot No.	%Insoluble nitrogen	%Amino acid nitrogen	$\frac{\% \text{Insol. N}_2}{\% \text{Am. ac. N}_2}$	Grass Juice Factor
1	3.14	0.21	14.95	4
3	3.00	0.18	16.68	3
4	3.01	0.24	12.54	3
5	3.12	0.16	19.50	5
6	3.06	0.18	17.00	5
7	3.00	0.21	14.29	3
8	3.04	0.24	12.67	1
9	2.94	0.25	11.75	1
10	2.87	0.18	15.95	3
11	2.82	0.17	16.60	3
12	2.90	0.18	16.10	3
13	3.42	0.21	16.28	2
14	3.02	0.17	17.78	4
15	3.32	0.16	20.75	4
16	2.58	0.19	13.59	3
17	2.84	0.25	11.35	2



Workers in the laboratory of Plant Physiology at the University of Illinois are now engaged in the attempt to relate the amount of grass juice factor with various other components of the leaf tissue. The preliminary data on a series of samples of young wheat grown in the field is presented in Table 1, and Figure 2 shows that there is a significant quantitative relationship between this substance and the ratio of insoluble nitrogen to amino-acid nitrogen. The significance of this relationship to the physiology of the plant will be made the subject of a detailed report in a later publication.

BIBLIOGRAPHY

1. Kohler, G. O., Elvehjem, C. A., and Hart, E. B., Growth stimulating properties of grass juice. Science, n.s. 83: 445. 1936.

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