centration of silicic acid in the urine of all but one of the calves not receiving the supplement was above saturation.

There were calculi both in the kidneys and bladders of all but one of the calves that did not receive salt, but there were none in those of calves that did receive salt. The silica content of calculi in the bladder was 74.0 percent and of those in the kidney 67.4 percent. The presence of the salt in the ration did not have a significant effect on the growth of the calves.

There were large variations in the total amounts of calculi present in the calves in the group that did not receive salt (range 0 to 188 mg). Four of these calves had more calculus material in the bladder than the average amount (about 50 mg) contained in stones that had previously caused urethral obstruction in ten similar calves. The amounts of calculi present were not related to the concentration of silicic acid in the urine. Therefore, other factors must also have affected the amounts of calculi formed. These factors are of considerable practical significance because they determine which animals are likely to develop urethral obstruction when on a diet of prairie grass.

It is suggested that sodium chloride prevented the formation of siliceous calculi in cattle given prairie grass hay by increasing water intake and urine volume and consequently reducing the concentration of silicic acid in the urine. Whether the administration of water to cattle in amounts greater than those they normally drink when consuming prairie hay will also prevent calculus formation remains to be determined.

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Protein Subunits: A Table

Table 1 is a list of proteins in which subunits are held together by noncovalent bonds. The entries are listed approximately in the order of increasing molecular weight of the macromolecular unit normally isolated from its natural source.

Individual polypeptide chains, held together by disulfide linkages, have not been individually classified as subunits; in insulin, for example, the subunit weight listed is 6000, that of the A and B chains together, since these chains are linked by disulfide bonds.

In many instances the subunit listed may not be the minimal subunit obtainable. The entry listed in Table 1 contains the minimal subunit that has been unequivocally obtained under environmental conditions that raise no suspicion of cleavage of peptide bonds. For some proteins, two (or more) stages

Table 1. Subunit constitution of proteins. Parentheses indicate doubt.

Protein	Molecular weight	Subunits	
		No.	Molecular weight
Insulin (*2*)	11,466	2	5,733
Thrombin (*3*)	31,000	(3)	(10,000)
β-Lactoglobulin (*4*)	35,000	2	17,500
Avidin (*5*)	53,000	3	18,000
Hemoglobin (*6*)	64,500	4	16,000
Glycerol 1-phosphate dehydrogenase (*7, 8*)	78,000	2	40,000
Alkaline phosphatase (*9*)	80,000	2	40,000
Enolase (*10*)	82,000	2	41,000
Liver alcohol dehydrogenase (*11*)	84,000	2	42,000
Procarboxypeptidase (*12*)	87,000	1	34,500
		2	25,000
Firefly luciferase (*13*)	92,000	2	52,000
Hexokinase (*14*)	96,000	4	24,000
Hemerythrin (*15*)	107,000	8	13,500
Tryptophan synthetase A (*16*)	29,000	1	29,000
Tryptophan synthetase B (*16*)	117,000	2	60,000
Mammary glucose 6-phosphate dehydrogenase (*17*)	130,000	2	63,000
Glyceraldehyde 3-phosphate dehydrogenase (*8, 18*)	140,000	4	37,000
Aldolase (*19*)	142,000	3	50,000
Lactic dehydrogenase (*20*)	150,000	4	35,000
Yeast alcohol dehydrogenase (*7, 21*)	150,000	4	37,000
Ceruloplasmin (*22*)	151,000	8	18,000
Threonine deaminase (*23*)	160,000	4	40,000
Thetin homocysteine methylpherase (*24*)	180,000	3–4	50,000
Fumarase (*25*)	194,000	4	48,500
Serum lipoprotein (*26*)	200,000	6	36,500
Tryptophanase (*27*)	220,000	2	(125,000)
Pyruvate kinase (*28*)	237,000	4	57,200
Catalase (*29*)	250,000	4	60,000
Phycocyanin (*30*)	266,000	2	134,000
	134,000	3	46,000
Mitochondrial adenosine triphosphatase (*31*)	284,000	10	26,000
Aspartyl transcarbamylase (*32*)	310,000	2	96,000
		4	30,000
Lipovitellin (*33*)	400,000	2	200,000
Apoferritin (*34*)	480,000	20	24,000
Urease (*35*)	483,000	6	83,000
Phosphorylase (*36*)	495,000	4	125,000
Fraction I protein, carboxydismutase (*37*)	515,000	24	22,000
β-Galactosidase (*38*)	520,000	4	130,000
	130,000	3–4	(40,000)
Myosin (*39*)	620,000	3	200,000
Pyruvate carboxylase (*40*)	660,000	4	165,000
	165,000	4	45,000
Thyroglobulin (*41*)	669,000	2	335,000
Propionyl carboxylase (*42*)	700,000	4	175,000
Lipoic reductase-transacetylase (*43*)	1,600 000	60	27,000
Glutamic dehydrogenase (*44*)	2,000,000	8	250,000
	250,000	5	50,000
Hemocyanin (*45*)	300,000–9,000,000		385,000
			70,000
			35,000
Chlorocruorin (*46*)	2,750,000	12	250,000
Bromegrass mosaic virus (*47*)	4,600,000	180	20,000
Turnip-yellow mosaic virus (*48*)	5,000,000	150	21,000
Poliomyelitis virus (*49*)	5,500,000	130	27,000
Cucumber mosaic virus (*50*)	6,000,000	185	21,500
Alfalfa mosaic virus (*51*)	7,400,000	160	35,000
Bushy stunt virus (*52*)	9,000,000	120	60,000
Potato virus X (*53*)	35,000,000	650	52,000
Tobacco mosaic virus (*54*)	40,000,000	2130	17,500

of dissociation can be clearly recognized; in such instances the entry includes two (or more) rows specifying the relations between the different aggregates.

In some instances an arbitrary decision has been made regarding the "natural" molecular weight, since some proteins form aggregating as well as disaggregating systems. Some such systems, such as the seed proteins, have been omitted entirely from Table 1 because it is still difficult to decide what is their "natural" state.

The most accessible references are given for each entry; they do not necessarily include the source most deserving of credit for establishing the subunit interrelations; such sources are mentioned in the cited works. Certain reviews (*1*) give less-complete compilations with more details for individual proteins.

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Activity and Responsivity in Rats after Magnesium Pemoline Injections

Abstract. *Rats injected intraperitoneally with magnesium pemoline avoided a buzzing sound (conditioned stimulus) associated with an electric shock to the feet (unconditioned stimulus) more frequently than controls. Drug-injected rats did not avoid the foot shock more frequently than controls, although the experimental rats did have shorter response latencies in the active avoidance task. In subsequent experiments which measured activity changes and response to the buzzing sound alone, it was found that magnesium pemoline caused a lesser decrease in activity level and a more sustained responsivity to the buzzer's sound than did control injections of tragacanth. This may account for the latency differences observed in the avoidance task.*

Recently, Glasky and Simon (*1*) reported that magnesium pemoline, a mild stimulant of the central nervous system, also stimulates the synthesis of brain RNA polymerases in the rat (*2*). Plotnikoff (*3, 4*) investigated the effects of oral administration of magnesium pemoline on the subsequent active avoidance behavior of rats. In the first of these behavioral studies (*3*), it was reported that rats receiving this drug had shorter response latencies after the first trial in an active avoidance task, and that this difference was still present 24 hours later during a retention test. Plotnikoff concluded, on the basis of