

In general the amino acids most effective in potentiating germination by pressure were those which were also most effective as germinants, either alone or with inosine, at 1 atm. However, there were exceptions to this generalization, e.g. L-serine was not germinative in any of the systems tested at 1 atm. and yet strongly potentiated germination of spores of *Bacillus cereus* at 200 atm., and L-leucine, L-isoleucine and L-aspartic

Table 4. Potentiation of pressure germination of spores by amino acids

Amino acid	Germination (%)* following incubation† as indicated below						
	<i>Bacillus cereus</i>				<i>Bacillus coagulans</i>		
	1 atm. additions at						
	1 mM for 1 hr	10 mM for		1 mM + 10 µM inosine for ½ hr	200 atm. additions at 1 mM for ½ hr	1 atm. additions at 1 mM for ½ hr	200 atm. additions at 1 mM for ½ hr
	1 hr	5 hr					
Control (no addition)	0	0	0	0	0	0	0
L-Alanine	80.5	100	100	100	100	44	92.5
L-α-Aminobutyric acid	95	95	100	100	99	0	90
L-Cysteine	0	99	100	17	96	0	2
L-Phenylalanine	0	92	100	73	100	0	0
L-Glutamine	47	7	20	100	88	n.t.‡	n.t.
L-Threonine	6	0	42	95	81	0	0
L-Valine	2	1	42	60	4	0	9
L-Tryptophan	0	10	67	89	88	0	0
L-Methionine	0	19	20	67	35	0	0
β-Alanine	0	2.5	29	96	100	0	1
L-Leucine	0	5	22	86	10	0	0
L-Isoleucine	0	0	11	100	19	0	0
Glycine	0	0	4	100	100	0	0
L-Tyrosine	0	n.t.	n.t.	63	100	0	0
L-Histidine	0	0	6	59	37	0	0
L-Aspartic acid	0	n.t.	n.t.	68.5	0	0	0
L-Serine	0	0	0	0	95.5	0	0
L-Lysine	0	0	5	0	0	0	0
L-Glutamic acid	0	n.t.	n.t.	0	0	0	0
D-Alanine	0	47	78	100	100	0	0
D-Methionine	0	0	0	15	5	0	0
D-Tryptophan	0	0	0	2	1	0	0
D-Cysteine							
D-Phenylalanine							
D-Threonine	n.t.	n.t.	n.t.	n.t.	0	0	0
D-Valine							
D-Leucine							

* Spores were activated before use (70°, 30 min.); germination was measured by recording percentage of phase-dark spores.

† Spores were incubated at 30° in 0.1 M-sodium phosphate (pH 8.0) plus the indicated amino acids.

‡ Not tested.

acid were less effective at 200 atm. than one would expect from their potentiation, with inosine, of germination at 1 atm.

Only in the case of alanine was the D-isomer about as effective as the L-isomer in potentiating pressure germination. Other D-isomers were relatively ineffective, even when the corresponding L-isomers were strong potentiators (e.g. cysteine, phenylalanine).