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Effect of 2-4 Dinitrophenol on Inhibition of Yeast Respiration by Cyanide.*

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Tainter and coworkers^{1, 2} and others³ have shown that 2-4 dinitrophenol (alpha-DNP) stimulates respiration in animals by direct action on the tissue cells. We have shown previously that this substance stimulates or inhibits respiration and fermentation of yeast (*Saccharomyces cerevisiae*, Race F) depending upon the concentration of the undissociated acid form.^{4, 5}

The experimental procedure used in the present study has been described elsewhere.^{4, 5}

Treatment of yeast suspended in glucose phosphate media with M/1000 NaCN of the same pH reduces respiration to about 14% of the control rate. If alpha-DNP be now added in a dose which causes optimal stimulation of the cyanide-free yeast, *i. e.*, in amount giving a free acid alpha-DNP concentration of 0.64 mg. per liter at pH 6.8,⁵ it further depresses the respiration of the yeast poisoned with cyanide.

However, the respiration of yeast poisoned with cyanide can be stimulated by alpha-DNP, provided that the concentration of the undissociated acid form of this agent be approximately 0.032 mg. per liter, *i. e.*, about 1/20 of the optimal dose for unpoisoned yeast. Under these conditions the respiratory rate of the poisoned yeast may be increased by about 20%. This relation has been demonstrated at pH 5.9 and pH 6.8. Further experiments on the action of alpha-DNP on respiration of organisms and tissues poisoned by cyanide are in progress.

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