Intake of *Chlorella pyrenoidosa* lowers serum methylmalonic acid levels in vegetarians with a suspected vitamin B12 deficiency.

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**Objectives**
Vitamin B\(_12\) is an essential nutrient that contributes to the maintenance of normal neuronal function and blood condition. Because vitamin B\(_12\) is available only in animal products, vitamin B\(_12\) deficiency has commonly occurred in vegetarians and caused elevated serum methylmalonic acid (MMA) levels. Vitamin B\(_12\) deficiency may be associated with megaloblastic anemia and gastrointestinal diseases.

Vegetarians are recommended to take vitamin B\(_12\) as supplements to prevent vitamin B\(_12\) deficiency. However, some supplements contain an inactive form of vitamin B\(_12\). Recently, *Chlorella pyrenoidosa* (hereafter, “*Chlorella*”) has also been shown to contain vitamin B\(_12\), although the effect of vitamin B\(_12\) contained in *Chlorella* on humans remains unknown. Thus, we assessed the effect of *Chlorella* in vegetarians.

**Methods**
Seventeen vegetarians with higher serum MMA levels took 9 g of *Chlorella* (21 μg of vitamin B\(_12\)) daily for 60 days, and their serum vitamin B\(_12\) and MMA levels were monitored.

**Results**
The serum vitamin B\(_12\) levels of all subjects showed an average increase by 21% on day 30 and 27% on day 60 as compared with those at the start of the study (Fig. 1).

The serum MMA levels of all subjects showed an average decrease by 32% on day 30 and 34% on day 60 as compared with those at the start of the study (Fig. 2). In addition, serum MMA levels were increased in 8 subjects after *Chlorella* intake 60 days followed by cessation of *Chlorella* intake 30 days.

On the basis of these results, it was suggested that vitamin B\(_12\) contained in *Chlorella* exerts an effect in humans after being absorbed by the body and thus that *Chlorella* intake is useful in overcoming vitamin B\(_12\) deficiency.
Study Report: Sun Chlorella Lab

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Authors: Randall Edward Merchant\textsuperscript{1}, Todd W. Phillips\textsuperscript{1}, Jay Udani\textsuperscript{2}
Affiliation: 1) Department of Physical Medicine and Rehabilitation, Virginia Commonwealth University, Richmond, Virginia, USA
2) Medicus Research, LLC, Northridge, California, USA

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Inquiry about this research report

Fig. 1  Rate of change in serum vitamin B\textsubscript{12} levels due to Chlorella ingestion

Fig. 2  Rate of change in serum methylmalonic acid levels due to Chlorella ingestion