



## POSTER NO 15

*The following are selected portions of published Abstracts relating to Sleep Physiology, Off-line Memory Processing and Dream Psychology. The research presented in these articles frames the argument and underscores the rationale for “fueling” the liver at bedtime to insure an adequate glycogen supply for the overnight fast. Honey is proposed as the ideal bedtime liver fuel.*

### Physiology of Sleep and Psychology of Dreams

AS, Eiser, **Seminal Neurology**, March; 25(1): 97-105

“The discovery of the close association between rapid eye movement (REM) sleep and dreaming and the development of sleep laboratory techniques ushered in a new era in the study of dreams . . . Some **more recent theories of dreaming emphasize an adaptive function related to emotion and a role in learning and memory consolidation** (emphasis added).”

### Sleep, Dreams, and Memory Consolidation

Payne, Jessica D, and Nadel, Lynn, “Sleep, dreams, and memory consolidation: the role of the stress hormone cortisol”, **LEARNING & MEMORY** 11:671-678; © 2004 by Cold Spring Harbor Laboratory Press; ISSN 1072-0502/04

“In addition to clinical evidence, there is experimental evidence that high levels of cortisol alter memory function. Patient populations with chronically elevated levels of cortisol, such as Cushing's syndrome, major depression, and schizophrenia, as well as asthmatic patients treated with the glucocorticoid prednisone are characterized by impaired memory function . . . not surprisingly, however, REM sleep in patients with Cushing's syndrome is strikingly similar to the sleep of patients with major depression, with REM latency being shortened and REM density being increased (see Shipley et al. 1992).”

### Schizophrenia – a Diabetic Brain State

Holden, R J and Mooney, P A, “Schizophrenia is a diabetic brain state: an elucidation of impaired neuro-metabolism”, **Med-Hypotheses**, 1994 Dec; 43(6): 420-35

“In this paper a detailed argument will be advanced in support of the notion that schizophrenia is fundamentally a diabetic brain state, henceforth referred to as 'cerebral diabetes'. In so doing, we shall provide a metabolic explanation for all the prominent symptoms currently known to be associated with cerebral diabetes and indicate some future therapeutic interventions.”

### Sleep - - Off-line Memory Processing

Stickgold R, Hobson JA, Fosse R, Fosse M, “Sleep, learning, and dreams: off-line memory reprocessing”, **Science**, 2001 Nov 2; 294(5544):1052-7

“Converging evidence and new research methodologies from across the neurosciences permit the neuroscientific study of the role of sleep in off-line memory reprocessing, as well as the nature and function of dreaming. Evidence supports a role for sleep in the consolidation of an array of learning and memory tasks (emphasis added). In addition, new methodologies allow the experimental manipulation of dream content at sleep onset, permitting an objective and scientific study of this dream formation and a renewed search for the possible functions of dreaming and the biological processes sub-serving it.

### EDITOR'S COMMENT

One of the most consistent anecdotal reports received from those who take a dose of honey prior to bed, is that of improved quality of sleep and increased dream recall. It's “like watching cable TV” one person commented. It is becoming clearer that dreams are not only essential for memory processing, they are critical to human psychological and physical health.

Impaired memory processing has been related to Cushing's syndrome, depression and schizophrenia. That schizophrenia has been characterized as a “diabetic brain state” and related to chronically elevated levels of cortisol, as in classical type 2 diabetes and insulin resistance in muscle, is consistent with the model of modern obesity and diabetes. These latter conditions are characterized by chronic cortisol-induced impairment of glucose metabolism and disposal, leading to impaired fat metabolism. When fat metabolism is impaired, both fuels - glucose and fats - are stored as abdominal fat manifesting a kind of reverse metabolism.

The editors postulate that honey may be shown to drive metabolism forward, resulting in increased fat metabolism during rest by virtue of improved hepatic and muscle cell metabolism assisted by the glucins. Overnight, in particular, honey may be the ideal fuel for improved quality of sleep, facilitating “off-line memory processing”, and enhancing REM sleep and dream induction. By reducing or eliminating chronic overproduction of cortisol, honey may be found to contribute to an improved psychology of dreams along with improved physiology of sleep.