



Wound Care Study Comparison

JUVEN[®] Results in Greater Collagen Synthesis Than Arginine Alone

	JUVEN <i>Patented Blend of Arginine, Glutamine, and HMB</i>	ARGININE
STUDY	Williams JZ, Abumrad N, Barbul A: Effect of a Specialized Amino Acid Mixture on Human Collagen Deposition. <i>Ann Surg</i> 2002;236:369-375.	Kirk SJ, Hurson M, Regan MC, et al: Arginine Stimulates Wound Healing and Immune Function in Elderly Human Beings. <i>Surgery</i> 1993;114:155-160.
OBJECTIVE	Examine effect of beta-hydroxy-beta-methylbutyrate (HMB), arginine, and glutamine supplementation on wound collagen accumulation.	Examine effect of arginine supplementation on immune function and tissue repair.
BACKGROUND	<ul style="list-style-type: none"> * Hydroxyproline (OHP) is a precursor to collagen * Collagen synthesis at wound site is an indicator of wound healing 	<ul style="list-style-type: none"> • Hydroxyproline (OHP) is a precursor to collagen • Collagen synthesis at wound site is an indicator of wound healing
METHODOLOGY	<ul style="list-style-type: none"> * 35 healthy elderly subjects (treatment mean age = 75.4 years) * Randomized, double-blind, placebo-controlled – Two-week protocol – n=18 JUVEN (14 g arginine, 14 g glutamine, 3 g HMB); n=17 Placebo (isonitrogenous and isocaloric placebo) * OHP measured at 7 and 14 days via implanted PTFE catheters 	<ul style="list-style-type: none"> • 45 healthy elderly subjects (treatment mean age = 74.3 ± 0.8 years) • Randomized, double-blind, placebo-controlled – Two-week protocol – n=30 Arginine (17 g free arginine + syrup); n=15 Placebo (placebo syrup) • OHP measured at 14 days via implanted PTFE catheters
RESULTS	<p>OHP deposition at 14 days</p> <ul style="list-style-type: none"> * JUVEN group: 72.2 ± 10.6 nmol/cm * Placebo group: 43.2 ± 7.2 nmol/cm * $P < 0.03$ 	<p>OHP deposition at 14 days</p> <ul style="list-style-type: none"> • Arginine group: 26.49 ± 2.39 nmol/cm • Placebo group: 17.41 ± 2.04 nmol/cm • $P < 0.02$



SUMMARY
 Greater OHP deposition in a wound may promote faster healing and new granulatory tissue. The production of collagen is important for adding strength to wounds, especially during the early phases of healing. In these studies of similar design,* the OHP deposition was 172% greater with JUVEN than with arginine alone. Therefore, JUVEN results in greater collagen synthesis than arginine alone, as evidenced by OHP content of the studied wounds.

*Studies were conducted at different times and with slightly different protocols.

Rebuilding Muscles. Rebuilding Lives.™





HMB + Arginine + Glutamine = JUVEN[®] to Support Wound Healing

JUVEN contains a unique combination of beta-hydroxy-beta-methylbutyrate (HMB), arginine, and glutamine. HMB may slow muscle breakdown by increasing protein synthesis, and arginine and glutamine are amino acids that support wound healing.

	ROLE	BENEFIT
HMB	Supports protein synthesis ¹ Decreases muscle breakdown ²	* Increased LBM
ARGININE	Enhances/supports synthesis of: * Hydroxyproline ^{3,4} * Growth hormone ⁵ * Nucleic acids ⁶ * Nitric oxide ⁷ * T-lymphocytes ⁸	* LBM preservation * Wound healing * Immune response
GLUTAMINE	Enhances collagen ⁹ and protein ¹⁰ synthesis Provides fuel for: * Lymphocytes and macrophages ¹¹ * Intestinal cells ¹²	* LBM preservation * Wound healing * Immune response * GI integrity

1 packet (23 g) = 1 serving 30 packets/carton 6 cartons/case



Flavor	List Number
Orange	Case: 57935 Carton: 58012
Grape	Case: 57936 Carton: 58011

Per 23-g Packet (Orange)

Calories	75*
Total Carbohydrate	7 g
Sugars	1 g†
HMB	1.2 g††
Amino Acids	14 g
L-arginine	7 g
L-glutamine	7 g
Potassium	245 mg
Calcium	200 mg
Phosphorus	95 mg

* Carbohydrates and HMB contribute 19 Calories; amino acids contribute 56 Calories.
† Grape flavor contains 2 g of sugar.
†† Provided by 1.5 g of calcium HMB.

www.juven.com
1-877-GO-JUVEN

References

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67211-003/SEPTEMBER 2006 LITHO IN USA

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