Informational Bias and Demographic Crossover

In Curcumin Dairy Mocha Bar Evaluation with New Recruits and Seasoned NCO Military Leaders

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Introduction

Curcumin has been associated with muscle recovery and other health benefits derived from antioxidant and sequestration properties (Ak & Gulcin, 2008; Jayaprakasha, Jaganmohan, & Sakariah, 2006; Shen, Zhang, & Ji, 2005). Much research has gone into the healthful uses of curcumin as a dietary component (Aggarwal, Surh, & Shishodia, 2007). Its potential use in the military provided merit in conducting this research.

Background

In order to garner some of the healthful benefits of curcumin, two forms of curcumin (a regular ingredient version and a specially processed nano-particle ingredient version that is highly absorbable by the body) were used to fortify mocha dairy bars. The research objectives were to determine: (a) is there a consumer sensory acceptability difference between the two types of treatment bars and a standard non-fortified bar?; and (b) is there a difference in acceptability between the treatment bars and standard bar when fortification information regarding the supplement is provided to the consumer?

The Consumer Research Team contacted OFIG (Operational Forces Interface Group) to coordinate visits with soldier consumers to perform the evaluation. Four groups of soldiers provided feedback.

Methods

The four groups of soldiers involved in the study were: (1) A cadre of specialized medical research officers and enlisted personnel who work within USARIEM (U.S. Army Research Institute of Environmental Medicine), (2) A cadre of experienced NCOs visiting the NSRDEC, (3) A newly recruited group of soldiers acting as Human Use Volunteers (HRVs), and (4) a group of National Guard Warfighters on drill assigned to the 3rd BN, 126th Aviation Unit. Each group was tested on different days according to the following respective dates: 24 October 2013, 28 October 2013, 30 October 2013, and 2 November 2013.

Five Samples were prepared for evaluation:

1. Control—Standard Dairy Mocha Bar—no added curcumin (labeled 172 or 405)
2. Treatment_1a—Regular curcumin fortified Dairy Mocha Bar—addition of regular grind curcumin (labeled 283)
3. Treatment_2a—Nano curcumin fortified Dairy Mocha Bar—addition of nano grind curcumin (labeled 394)
4. Treatment_3b—Regular curcumin fortified Dairy Mocha Bar—addition of regular grind curcumin (labeled 516 *plus* inclusion of the consumer information statement: "Fortified with curcumin: a known natural anti-oxidant & anti-inflammatory compound with potential benefits for muscle soreness & recovery")
5. Treatment_4b—Nano curcumin fortified Dairy Mocha Bar—addition of nano grind curcumin (labeled 627 *plus* inclusion of the consumer information statement: "Fortified with curcumin: a known natural anti-oxidant & anti-inflammatory compound with potential benefits for muscle soreness & recovery").

Methods continued…

Samples were presented to test subjects in one of two possible sets: (a) the non-information set (those who were told nothing about the benefits of curcumin) and (b) the information set (those who were provided consumer fortification information about curcumin's benefits). For set "a" the evaluators received a standard dairy Mocha Bar (control labeled 172) plus treatment_1a and treatment_2a. Evaluators in set "a" received and evaluated the three samples in a balanced, randomized fashion using Natick Forms 4755, 4756, 4757, 4758, 4759, and 4760.

Evaluators for set "b" received a standard Dairy Mocha Bar (control labeled 405), treatment_3b, and treatment_4b. Evaluators in set "b" received and evaluated the three samples in a balanced, randomized fashion using Natick Forms 4761, 4762, 4763, 4764, 4765, and 4766.

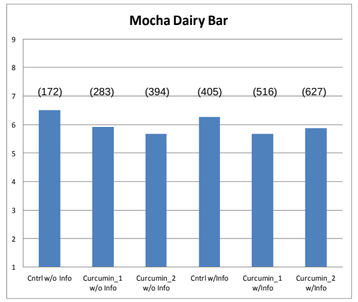
Evaluations occurred with participants being briefed and screened for potential diet risks. Most personnel were qualified based on the following criteria: not allergic or hypersensitive to curry, not pregnant, and not untreated for diabetes or unregulated blood pressure. They were then presented with a zip-lock bag that contained three samples, a pencil, and the appropriate survey. Surveys were collected after they were filled out. Most participants completed the survey within 3-8 minutes

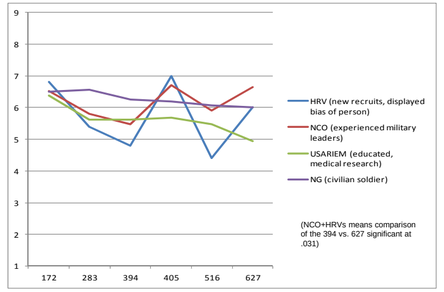
Participation was voluntary and some chose not to participate as was their choice (non-participation was rare except with the HRVs who had present a vocal and non-planned adversary of the sample types. This adversary had some knowledge of the test samples beforehand and also had significant familiarity with the group. The interaction likely influenced to some degree members of that group's evaluation and participation levels).

Results

HRVs (n=10)			Visiting NCOs (n=41)			USARIEM (n=37)			126th Aviation, NG (n=32)		
Sample	Mean	Set	Sample	Mean	Set	Sample	Mean	Set	Sample	Mean	Set
172	6.80	a	172	6.52	a	172	6.39	a	172	6.50	a
283	5.40	a	283	5.81	a	283	5.61	a	283	6.56	a
394	4.80	a	394	5.48	a	394	5.61	a	394	6.25	a
405	7.00	b	405	6.70	b	405	5.68	b	405	6.19	b
516	4.40	b	516	5.90	b	516	5.47	b	516	6.06	b
627	6.00	b	627	6.65	b	627	4.95	b	627	6.00	b
Combined w&wo info			Combined w&wo info			Combined w&wo info			Combined w&wo info		
172 + 405	6.90	a+b	172 + 405	6.61	a+b	172 + 405	6.03	a+b	172 + 405	6.34	a+b
283 + 516	4.90	a+b	283 + 516	5.85	a+b	283 + 516	5.54	a+b	283 + 516	6.31	a+b
394 + 627	5.40	a+b	394 + 627	6.05	a+b	394 + 627	5.27	a+b	394 + 627	6.13	a+b

Results continued…





Report

Hedonic_Score

Unit_type	Info_pres_type	Mean	N	Std. Deviation
	No Info	6.00	20	1.919
HRV (NewRecruit)	With Information	5.20	10	2.821
	Total	5.73	30	2.243
	No Info	5.82	73	1.743
MedRes (Higher Edu)	With Information	6.34	38	7.099
	Total	6.00	111	4.359
	No Info	6.12	83	2.009
NCO (Seasoned)	With Information	6.28	40	1.664
	Total	6.17	123	1.898
	No Info	6.38	64	1.589
NG-Civ	With Information	6.03	32	1.959
	Total	6.26	96	1.718
	No Info	6.09	240	1.817
Total	With Information	6.14	120	4.275
	Total	6.11	360	2.873

Discussion

It appears that the introduction of information creates variation of responses particularly with highly educated military personnel involved in the field of environmental medicine. The responses appear to differ by demographic variables. NCOs and HRVs have an atypical response to the introduction of information.

Bias created perhaps by information, appears to significantly influence liking particularly with NCOs and HRVs with nano particle curcumin treated bars. This is contrary to the other two groups.

Conclusions/Recommendations

Further analysis of the data may be warranted. Further research into the biases triggering disparity and an unusual response between military groups is warranted. Perhaps the nature of full-time, well educated and/or civilian work has an influence on how information is processed. There were subtle sensory differences between the two curcumin samples to consider also. Perhaps a threshold between the two types of curcumin also had an influence.

References

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