

# JAMAICA BRAND

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## GENETICS     DIETETICS ATHLETICS

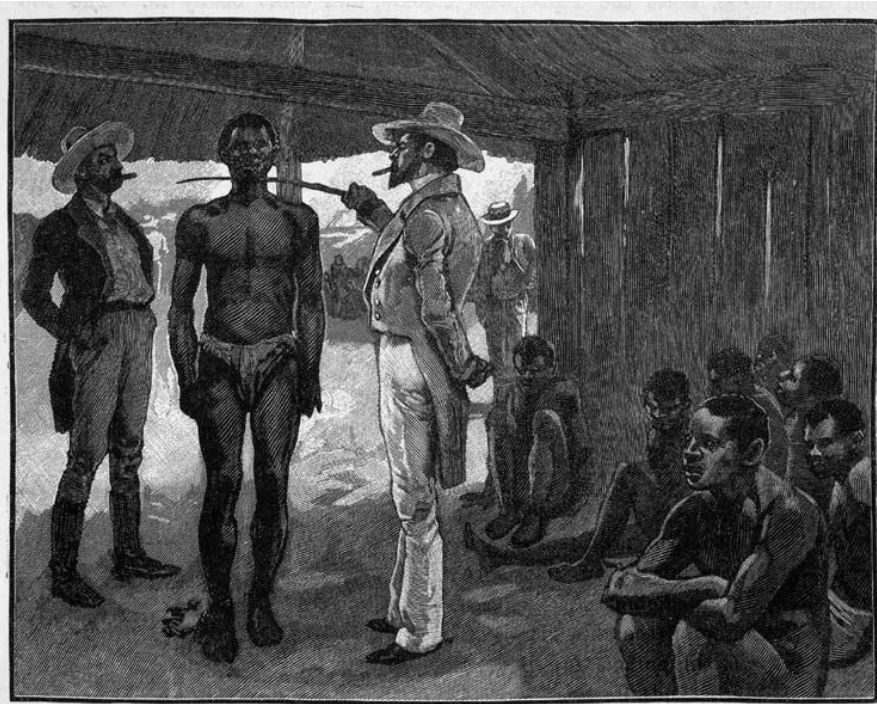
**Prof the Hon Errol Y St A Morrison OJ, Hon LLD, Hon DSc  
MD, PhD, FRCP(UK), FACP, FRSM(UK), FRSH(UK), FICD, FJIM  
Director General, National Commission on Science & Technology**

# GENETICS

# THE CARIBBEAN AND CENTRAL AMERICA



# “Eugenic effects” of the slave trade



**only the BEST(physically) were selected**

# 1952, 4 x 400 team

5



# World Record

16<sup>th</sup> August  
2008



16<sup>th</sup> August 2009



**Usain Bolt**



# GENETICS (*BIOMECHANICAL*)

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- **LONG LIMBS**
- ***NARROW HIPS***
- ***LOW SUBCUTANEOUS FAT***
- ***SHALLOW THORACIC CAGE***

# KNEE LIFT



**BLACKS**

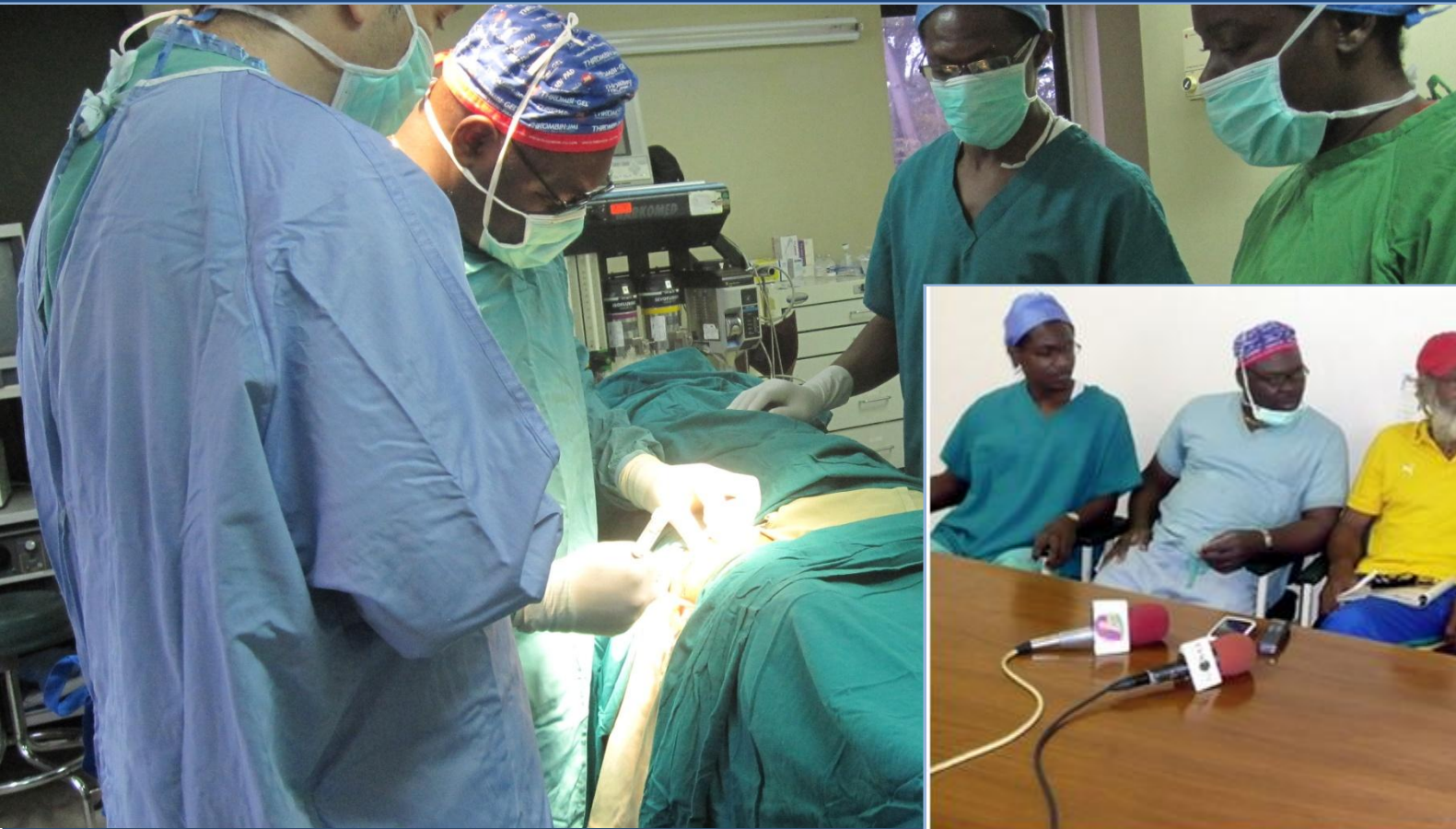


**ASIATICS  
WHITES**

# The Speed Gene

10

- Performance related genes seen in most of the World's popn:
- ACTININ 3 (577RR/577RX)
- ACE ...et al
- **NOTHING SPECIFIC**



Dr Yannis Pitsiladis (right) of the University of Glasgow, Scotland, explains the reasons behind Thursday's University of Technology (UTech) biopsy test on Jamaican Olympian Michael Fray (second right), at a press conference at the Winchester Medical Centre. Looking on are Dr Colin Gyles (left), dean of UTech's Faculty of Science and Sport, and Dr Neville Graham, associate professor and head of UTech's Caribbean School of Sports



## **SOME BIO-MEDICAL MECHANISMS IN ATHLETIC PROWESS**

**MORRISON EY, COOPER PD**

**WEST INDIAN MEDICAL JOURNAL  
2006, 55(3): 205-209**

### **Hypothesis:**

**“In the uniquely lethal West African malarial environment, individuals with sickle cell trait possessed a significant selective advantage. Although sickling is caused by a single amino acid substitution, valine for glutamic acid, encoding the sixth amino acid of the beta chain of the hemoglobin molecule, we will argue that the mutation triggered a series of physiological & anatomical adjustments, which incidentally, had favourable athletic consequences.”**

# GENETIC AND MOLECULAR ASPECTS OF SPORTS PERFORMANCE

EDITED BY CLAUDE BOUCHARD  
AND ERIC HOFFMAN



THE ENCYCLOPAEDIA OF SPORTS MEDICINE  
AN IOC MEDICAL COMMISSION PUBLICATION



WILEY-BLACKWELL



## Conclusions

**Genetic studies of elite distance runners from Kenya and Ethiopia and elite sprinters from Jamaica, USA and Nigeria do not find that these athletes possess a unique genetic makeup; rather they serve to highlight the high degree of genetic diversity among ethnic groups. It is unjustified, therefore, to regard ethnic differences in sporting success as genetically mediated; to justify doing so one must identify the genes that are important, which until now has proven elusive.”**

# ATHLETICS

# Primary school competition

15



PLATE 11.1 The competitive spirit is nurtured in Jamaican children from an early age. (*Gleaner* photograph.)

2009...

....

**Usain Bolt & Coach**



# Beijing 2008

17



# push-pull

18

***Push...*** dietary

**phytosteroids + phytates**

***Pull...*** early training

# DIETETICS

# yam tubers

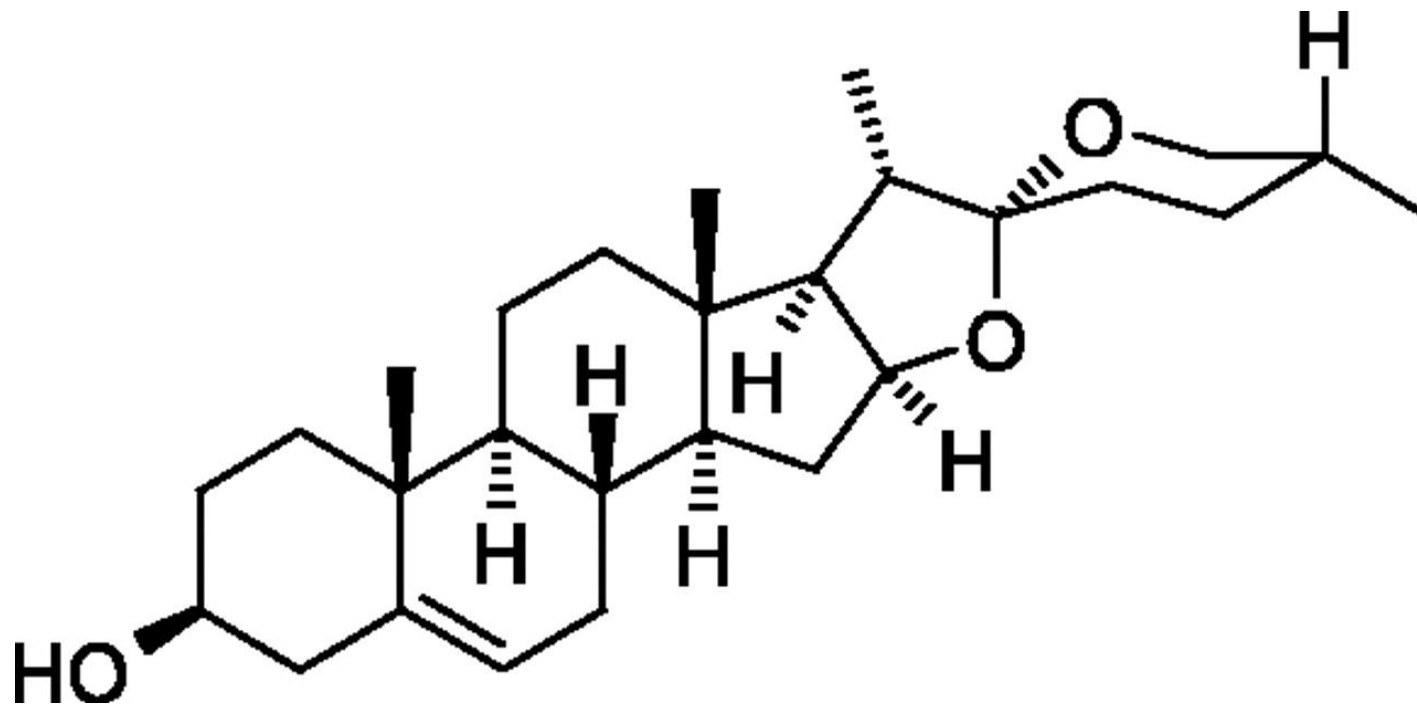
20



# SAPOGENINS

21

- **Active components: diosgenin(80%),  $\beta$ -sitosterol, pennogenin and stigmasterol.**
- **DIOSGENIN is precursor of anabolic steroids, AS (C<sub>19</sub>), GLUCOCORTICOIDS (C<sub>21</sub>) & Estrogens C<sub>18</sub>**

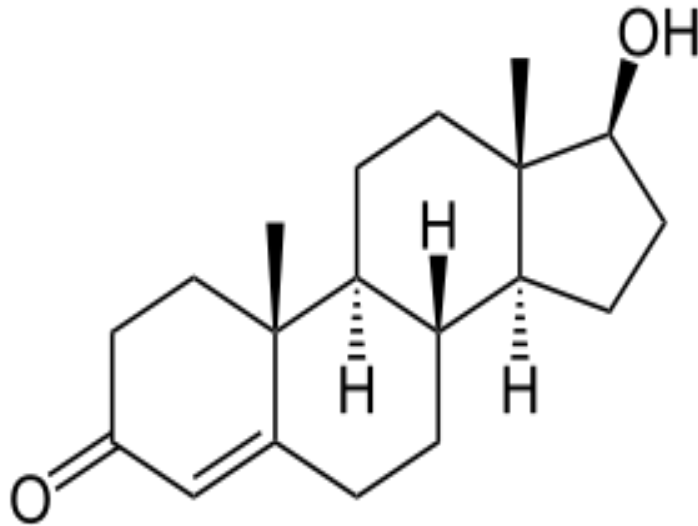


**Diosgenin**

**C<sub>27</sub>**

# Testosterone (C<sub>19</sub>)

23



# PHYTOESTROGEN CONTENT

FOOD ITEMS	PHYTOESTROGEN CONTENT (mg /g ) <b>C</b> <sub>18</sub> (steroid molecule)
Flax seeds	3.8
Almonds	0.0
Soybeans	1.0
Tofu	0.3
Pistachio nuts	0.0
Cashews	0.0
Bread(oats,rye,wheat/multigrain)	0.1
Soy milk	0.0
Olive oil	0.0
Tea (green)	0.0

# Yam extracts

25

## **Diosgenin** **(phytoestrogen)** **(~4mg/g)**

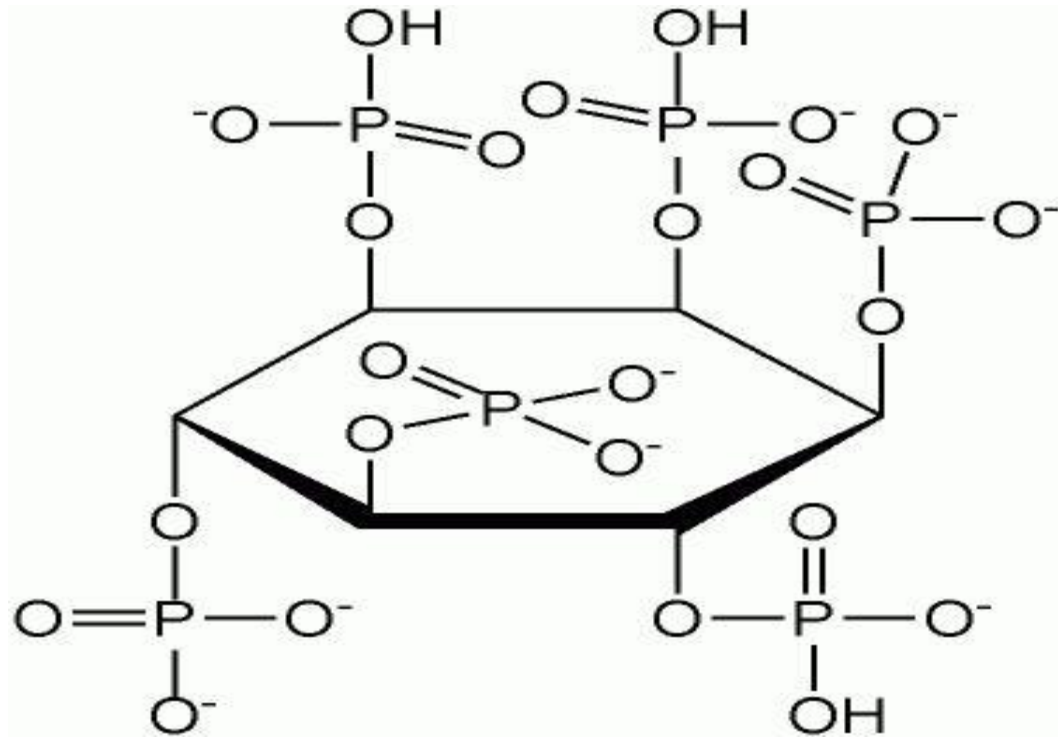
- **Dioscorea cayenensis spp.**

*(Asemota et al, 2003)*

# Green Bananas

26





**Phytate**

**PHYTATES (IP<sub>6</sub>)**



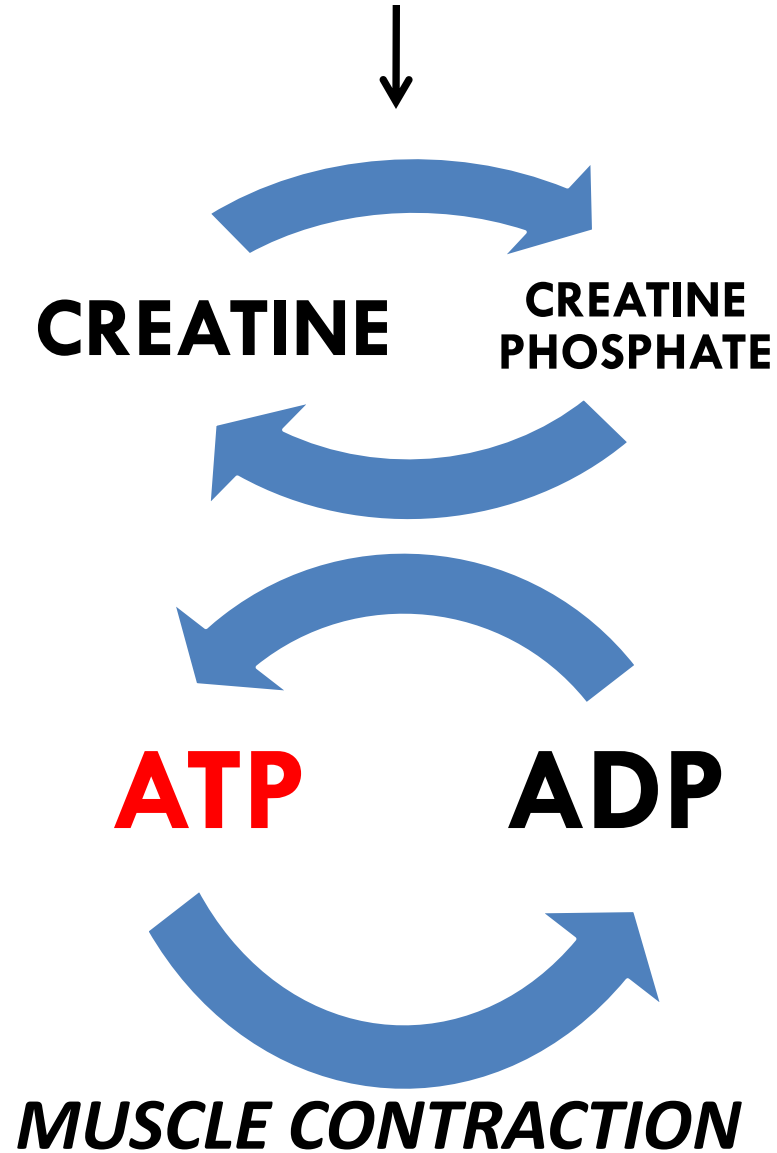
**CREATINE**

**CREATINE  
PHOSPHATE**

**ATP**

**ADP**

***MUSCLE CONTRACTION***



# MUSCLE

# LIVER

ADP

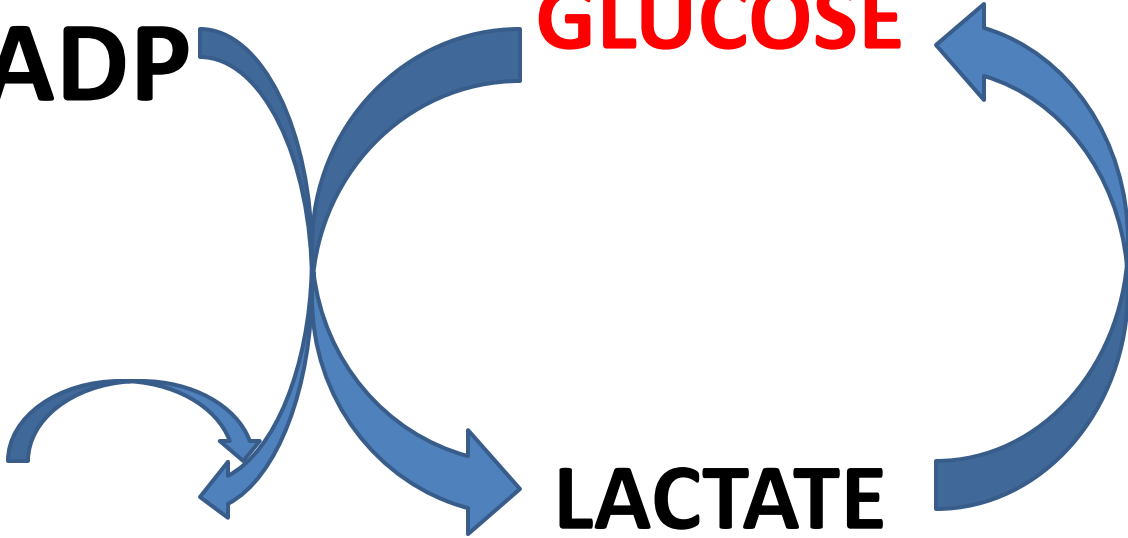
GLUCOSE

- Phytates
- Cortisol
- Anabolic steroids

phytates

LACTATE

ATP



# PHYTATE CONTENT

<b>FOOD ITEMS</b>	<b>PHYTATE CONTENT (mg/ g )</b>
Oatmeal	9.43
Wheat bran	30.11
Almonds	12.80
Cashew	18.66
Peanuts (toasted)	9.33
Peanut (ungerminated)	8.21
Brown Rice	125.09
Oat flakes	11.74
Yam	6.37
Coconut	3.57
White flour	2.58
Rice (polished)	0.12- 6.6
Okra	0.5
Infant cereal (barley)	8.97
Infant mixed grain cereal	5.10

# Green Bananas

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**Phytates**

**21.3 mg/g**

***(Yams 5-6mg/g)***

*(Asemota et al , 2003)*

# MORRISON'S HYPOTHEGRAM FOR ATHLETIC ADVANTAGE

## BIOMECHANICAL

## BIOCHEMICAL

- **LOW SUBCUTANEOUS FAT**
- **LONG LIMBS**
- **NARROW HIPS**

- **INCREASED TISSUE OXYGENATION**
- **INCREASED ANAEROBIC ENERGY**

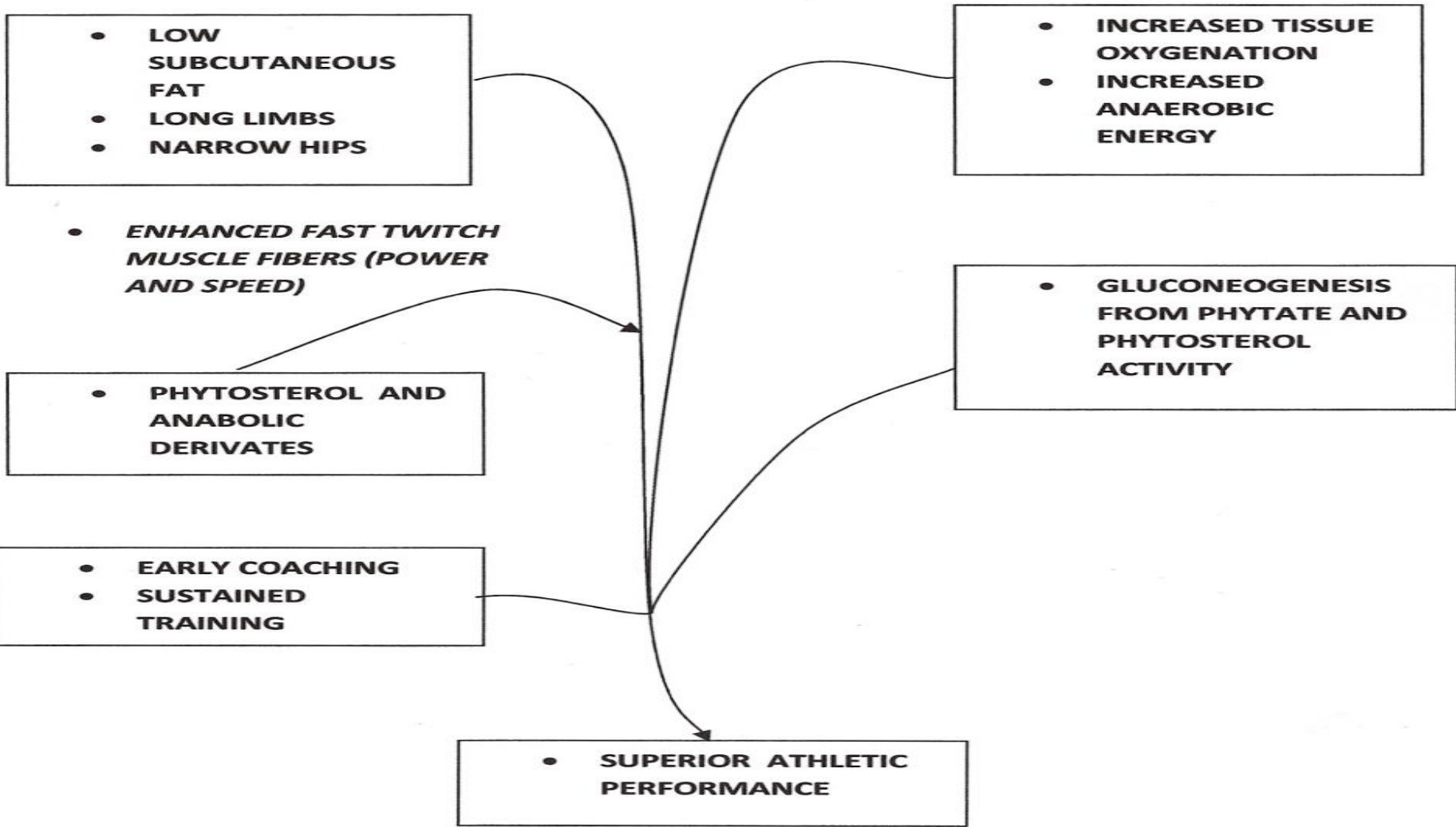
- ***ENHANCED FAST TWITCH MUSCLE FIBERS (POWER AND SPEED)***

- **GLUCONEOGENESIS FROM PHYTATE AND PHYTOSTEROL ACTIVITY**

- **PHYTOSTEROL AND ANABOLIC DERIVATES**

- **EARLY COACHING**
- **SUSTAINED TRAINING**

- **SUPERIOR ATHLETIC PERFORMANCE**



## BIOMECHANICAL

- ANATOMY
- EARLY & SUSTAINED TRAINING
- ENHANCED MUSCLE FIBRES

## BIOCHEMICAL

### ENHANCED

- OXYGENATION  
(Recovery)
- GLUCONEOGEN-  
ESIS
- ATP Replenishment



**SUPERIOR ATHLETIC  
PERFORMANCE**

***OPPORTUNITIES***

**SPONSORSHIPS**

**BRANDING**

**PRODUCTS**

# PRODUCTS

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## NUTRACEUTICALS

*eg: extracts from*

*Plants*

*Animals*

*Minerals*

# PRODUCTS

**COD LIVER OIL**

**HONEY**

***HERBAL TEAS***

***GINSENG***

***SEA SALT***

***LIMESTONE***

# Nutraceuticals..fastest growing industry

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**Due to:**

- Aging population**
- Increase in health & wellness consciousness**
- Increased desire to embrace natural products medicine vs synthetics**

# Dollars & Sense

- **Cod Liver Oil- United States spends about \$1.2b p.a. for fish oil pills and related supplements**

*(Washington Post, 2015)*

- **Honey- \$1.5b global market. In 2012 , Jamaica exported 1,274 kg to various markets valued at just over US\$ 7000.**

*(Jamaica Gleaner , 2015)*

# DOLLARS & SENSE



**Ginger-** The global demand was 423,000 metric tonnes valued at **US\$614m in 2010**

*(The Jamaica Gleaner, 2012)*



**Ginseng  
Roots up  
to US  
\$400/lb  
(world  
market)**

# Herbal Tea industry

- **In 2013, a US\$38.84b market and estimated CAGR of 2.8%.**
- **Projected market to reach a value of US\$47.20 billion by 2020.**

***-SIR ARTHUR LEWIS, 1960s***



**“ THERE ARE SOME THINGS WHICH  
WE IN THE CARIBBEAN WILL DO  
BEST...**

**...AND THERE ARE SOME THINGS  
WHICH ONLY WE IN THE CARIBBEAN  
WILL WANT TO DO ”**



**Usain Bolt  
holding the  
Jamaican Yellow  
Yam, a rich  
source of nutrient  
and the so called  
secret to his  
'lightning Bolt'  
speed.**





***”...I don’t think there was ever such an international brand as ‘Bolt’ endorsing a product which was not fully exploited and commercialised...”***



# JAMAICA'S

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## NUTRACEUTICALS

*(For athletes, youth)*

*eg: extracts from*

*yams, bananas,*

*sweet potatoes*

# Nutraceuticals: Global Markets

- **North America, Europe, China, India, Brasil are major markets**
- **The US is the most active, with a contribution of over \$86 billion of the global revenues of nutraceuticals over the years.**
- **The global nutraceuticals product market reached \$142.1b in 2011 and is expected to reach \$204.8b by 2017, growing at a CAGR of 6.3%, (Transparency Market Research, 2015)**
- **Currently the product sales + value added industries =US\$600b.**



*Herein lies the  
epitome of  
WISDOM*

*May we like him  
ponder upon these  
thoughts!*