THE SHOT PUTT

ATP-PC

This is the simplest energy system. It is the anaerobic energy system that utilizes ATP stored in the muscle to create energy for movement. ATP is broken down and can be synthesized using Phosphocreatine and enzymes. ATP can then be used to create more energy. It is the system used for short bursts of high-intensity work lasting approximately 10 seconds or less, and does not require oxygen to make the energy.

WORLD RECORDS:
RANDY BARNES (USA) 23.12M
NATALYA LISOVSKAYA (SOV) 22.63M

The human body uses carbohydrates, fats and proteins to supply itself with the energy need to stay alive and perform tasks. In the human body, ATP, adenosine triphosphate, is broken down to create energy for muscle contraction. The human body creates ATP aerobically and anaerobically. There is one aerobic energy system and two anaerobic energy systems. Most activities of the body use a compilation of all three energy systems to generate the energy needed
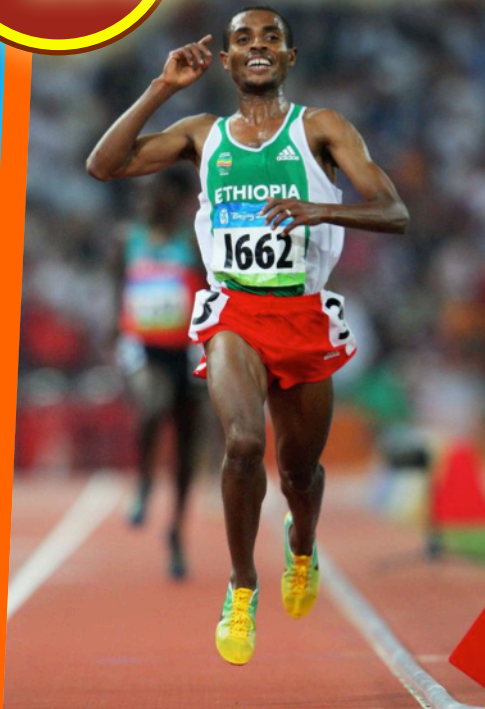Source: www.livestrong.com.

CHALLENGE:
HOW MANY SHOTS DOES IT TAKE YOU TO SHOOT THE SAME DISTANCE OF RANDY OR NATALYA? (ADD UP THE DISTANCE OF YOUR SHOTS)
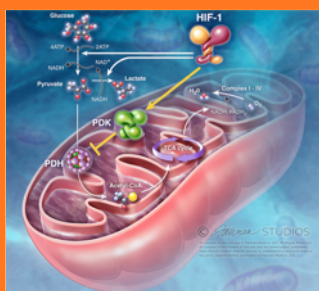
QUESTIONS
WHAT DOES ANAEROBIC AND AEROBIC MEAN?
IN WHAT FORM IS ENERGY STORED IN YOUR BODY?
WHAT CAN YOU SAY ABOUT THE ENERGY STORAGE IN RANDY'S MUSCLES?

THE 5000M

THE ENERGY CONTINUUM IS THE CONTINUAL MOVEMENT BETWEEN THE THREE ENERGY SYSTEMS; (ATP/PC SYSTEM, GLYCOLYTIC/LACTIC ACID SYSTEM AND AEROBIC SYSTEM) DEPENDING ON THE INTENSITY AND DURATION OF THE EXERCISE. IF ACTIVITY X IS 90% ANAEROBIC, THE IT WILL BE 10% AEROBIC
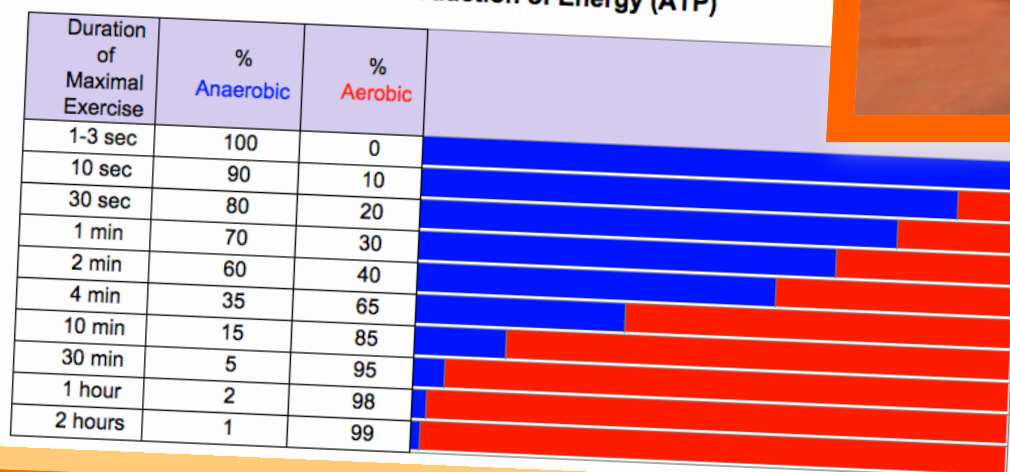
THE AEROBIC SYSTEM USES CARBOHYDRATES, FATS AND PROTEIN AS ENERGY SOURCE TOGETHER WITH OXYGEN. THE NUTRIENTS IN OUR FOOD ARE TRANSFORMED INTO GLUCOSE OR GLYCOGEN AND USED BY THE MITOCHONDRIA IN OUR CELLS. THESE ARE THE ENERGY FACTORIES OF OUR BODY

WORLD RECORD 5000M:

KENENISA BEKELE (ETH) 12.37 MIN

TIRUNESH DIBABA (ETH) 14.11

Proportion of Aerobic / Anaerobic Production of Energy (ATP)

Duration of Maximal Exercise	% Anaerobic	% Aerobic	
1-3 sec	100	0	
10 sec	90	10	
30 sec	80	20	
1 min	70	30	
2 min	60	40	
4 min	35	65	
10 min	15	85	
30 min	5	95	
1 hour	2	98	
2 hours	1	99	

CHALLENGE:

BEKELE RUNS 23.8 KM/HRS
HOW FAR CAN YOU RUN IN 12 MINUTES?
CALCULATE HOW FAST THAT IS

QUESTION

WHAT WOULD BE THE MAIN ENERGY SYSTEM USED DURING A 1500M RUN?
WOULD IT CHANGE DURING DIFFERENT PHASES IN THE RACE? WHY?

THE SPRINT

THE DIET OF ATHLETES MUST MEET THEIR ENERGY REQUIREMENTS AS WELL AS PROVIDING NUTRIENTS TO USE FOR TISSUE GROWTH AND REPAIR. THERE ARE SIX GROUPS OF NUTRIENTS THAT SHOULD BE PRESENT IN EACH BALANCED DIET, IN ADDITION TO WATER

- CARBOHYDRATES (SIMPLE AND COMPLEX) 55% OF DAILY CALORIC INTAKE
- FATS 30% OF DCI
- PROTEINS 15% OF DCI
- VITAMINS
- MINERALS
- FIBRE

THE BODY NEEDS ENERGY WHEN IT TAKES PART IN ACTIVITY. THE AMOUNT OF ENERGY DEPENDS ON THE INTENSITY AND DURATION OF THE EXERCISE.

WORLD RECORDS 100M SPRINT:
USIAN BOLT (JAM) 9.58 SECONDS

FLORENCE GRIFFITH JOYNER (USA) 10.49 SECONDS

CHALLENGE

HOW FAR CAN YOU GET IN 10.5 SECONDS?

QUESTION

THE BASIC ENERGY REQUIREMENT OF AVERAGE 60KG PERSON IS GENERALLY GIVEN AS 1.3 KCAL PER HOUR PER KILOGRAM OF BODY WEIGHT.
SO, SOMEONE OF 60KGS REQUIRES: 1.3 X 24 (HRS) X 60 (KGS) = 1872 KCAL A DAY

THIS ENERGY REQUIREMENT INCREASES DURING EXERCISE TO 8.5 KCAL PER HOUR PER KG
SO, IN 1 HR TRAINING SESSION THE PERFORMER NEEDS EXTRA:
(8.5 – 1.3) X 1 (HR) X 60 (KGS) = 432 KCAL

WORK OUT YOUR OWN DAILY ENERGY REQUIREMENTS
1.3 X 24 X YOUR WEIGHT (KGS) = _____ KCAL DAILY
+
(8.5 – 1.3) X 1 (HR) X YOUR WEIGHT (KGS) = _____ KCAL FOR 1 HR

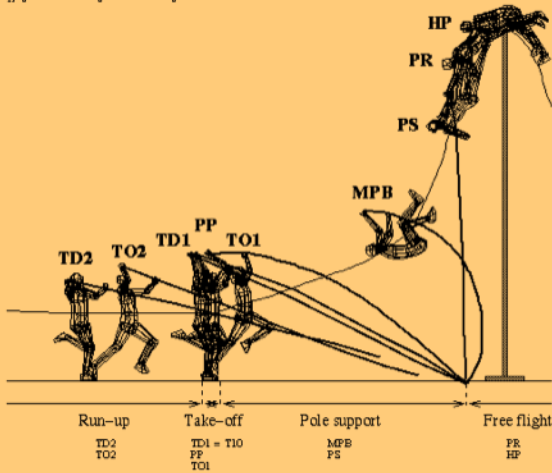DAILY ENERGY REQUIREMENT WHEN 1 HR OF EXERCISE IS PERFORMED:
(ADD THE TWO TOGETHER)

THE POLE VAULT

The mechanics of a pole vault involve the most basic law in physics, <u>Newton's second law</u> - F=ma (the force (F) exerted on an object (m) will result in a acceleration (a) in the same direction of the force, proportional to the magnitude of the force). The run-up (horizontal force) will be transferred into height (vertical force) until gravity slows the motion down (deceleration), this is when you should push

HP
PR
PS
MPB
PP
TD1   TO1
TD2   TO2
TD2

Run–up   Take–off   Pole support   Free flight

TD2   TD1 = T10   MPB   PR
TO2   PP   PS   HP
           TO1

CHALLENGE

HOW MANY JUMPS DOES IT TAKE YOU TO GET TO THE SAME HEIGHT AS RENAULD OR YELENA?
(ADD UP YOUR JUMPS)

QUESTION

WHY IS IT IMPORTANT THAT THE POLE DOES NOT SLIP AWAY?
WHERE WOULD BE THE BEST PLACE TO HOLD THE POLE IN YOUR VAULT? WHY?

THE PUSH PHASE IN UPWARD DIRECTION (WITH 180° TURN)

WORLD RECORDS:
RENAULD LAVILLENIE (FRA) 6.16M

YELENA ISINBAYEVA (RUS) 5.06M