



آیت نمبر 25-28

قرآنی دعائیں

سورۃ غلط

رَبِّ اشْرَحْ لِي صَدْرِي ۝ وَيَسِّرْ لِي أَمْرِي ۝
وَاحْلُلْ عُقْدَةً مِّن لِّسَانِي ۝ يَفْقَهُوا قَوْلِي ۝

پروردگار، میرا سینہ کھول دے، اور میرے کام کو میرے لیے
آسان کر دے اور میری زبان کی گرہ سلجھا دے تاکہ لوگ میری
بات سمجھ سکیں

رَبِّ زِدْنِي عِلْمًا

MY LORD! INCREASE ME IN KNOWLEDGE.

FOOD SAFETY AND QUALITY MANAGEMENT

DHND

YEAR-V

Session: 2015-2020

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FSQM L # 15 A.
FOOD TOXICOLOGY
AND
NUTRITIONAL TOXICOLOGY

HISTORICAL PERSPECTIVE

“THE APPEARANCE OF DISEASE IN HUMAN POPULATIONS IS INFLUENCED BY THE QUALITY OF AIR, WATER, AND FOOD; THE TOPOGRAPHY OF THE LAND; AND GENERAL LIVING HABITS.”

(Hippocrates)

POISONS & REMEDY

“ALL SUBSTANCES ARE POISONS; THERE IS NONE THAT IS NOT A POISON. THE RIGHT DOSE DIFFERENTIATES A POISON AND A REMEDY”.

Paracelsus (1493-1541): The Father of Modern Toxicology

TOXICOLOGY

- TOXICOLOGY FORMERLY THE SCIENCE OF POISONS, NOW
- THE SCIENCE THAT DEALS WITH THE ADVERSE EFFECTS OF CHEMICALS ON LIVING ORGANISMS AND ASSESSES THE PROBABILITY OF THEIR OCCURRENCE

- TOXICOLOGY IS THE SCIENCE OF **POISONS**, **TOXICANTS**, OR **TOXINS**
- **TOXINS** ARE SMALL POISONOUS MOLECULES, PEPTIDES, OR ANIMALS, AND OTHER ORGANISMS LIKE VIRUSES, FUNGI, BACTERIA, OR PROTOZOA.

- THE TERM *TOXIN* USUALLY REFERS TO A POISON DERIVED FROM A PROTEIN OR CONJUGATED PROTEIN PRODUCED BY SOME HIGHER PLANT, ANIMAL, OR PATHOGENIC BACTERIA THAT IS HIGHLY POISONOUS FOR OTHER LIVING ORGANISMS, E.G., BOTULINUM TOXINS

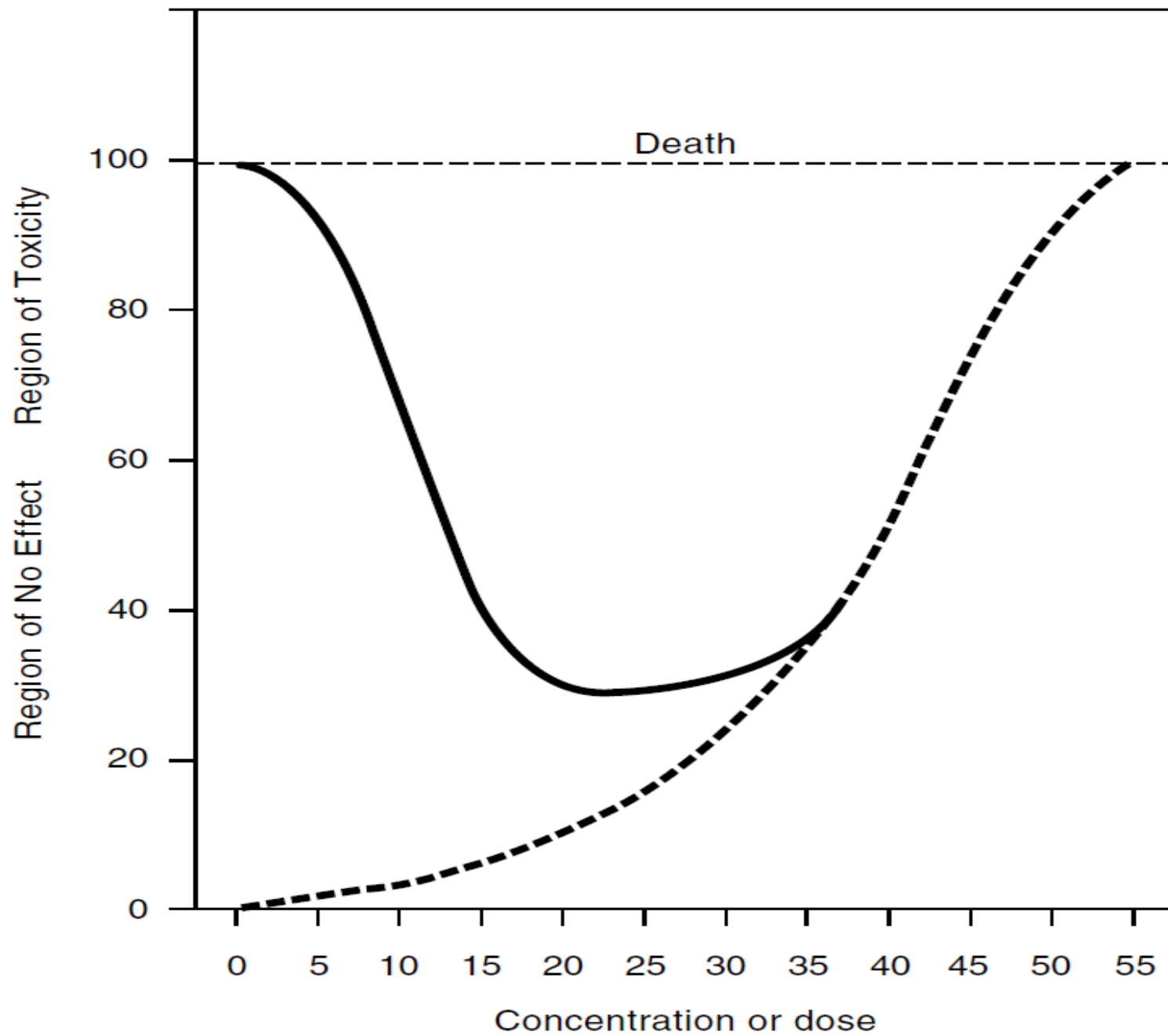
- THE TERM **TOXICANT** CAN BE A SYNONYM FOR **POISON** , OR THE TERM POISON MIGHT BE MORE APPROPRIATE FOR THE MOST POTENT SUBSTANCES, I.E., SUBSTANCES THAT INDUCE ADVERSE EFFECTS AT EXPOSURE LEVELS OF A FEW MILLIGRAMS PER KILOGRAM OF BODY WEIGHT
- A TOXIN IS A POISON, NOT ALL POISONS ARE TOXINS

- **FOOD TOXICOLOGY** DEALS WITH SUBSTANCES FOUND IN FOOD THAT MIGHT BE HARMFUL TO THOSE WHO CONSUME SUFFICIENT QUANTITIES OF THE FOOD CONTAINING SUCH SUBSTANCES
- **FOOD TOXICITY** – POISONING DUE TO FOOD BOREN HAZARDS

- **NUTRITIONAL TOXICOLOGY** IS THE STUDY OF THE NUTRITIONAL ASPECTS OF TOXICOLOGY
- NUTRITIONAL TOXICOLOGY IS RELATED TO AND MIGHT EVEN OVERLAP BUT IS NOT SYNONYMOUS WITH **FOOD TOXICOLOGY**

- POTENTIAL SOURCES OF TOXICANTS IN FOOD INCLUDE NUTRIENTS, NATURAL FOOD TOXICANTS, CONTAMINANTS, AND CHEMICALS OR SUBSTANCES INTENTIONALLY ADDED TO FOOD (FOOD ADDITIVES).

- THERE ARE SOME NOTABLE EXAMPLES OF **NATURAL FOOD TOXICANTS:**
- TOXICANT IS THE TOXIN PRODUCED BY THE PUFFER FISH
- POISONOUS MUSHROOM *Amanita muscaria*
- MANY PHYTOCHEMICALS ARE PRODUCED AS SECONDARY METABOLITES, HAVE BECOME IMPORTANT DEFENSE CHEMICALS USED BY THE PLANT



FOOD ADDITIVES

- BUTYLATED HYDROXYTOLUENE (BHT)
- NITRITE
- MICROBIAL RETARDANTS SUCH AS CALCIUM PROPIONATE
- TEXTURING AGENTS AND FLAVORS
- RESIDUES FROM FERTILIZERS, PESTICIDES, VETERINARY PHARMACEUTICALS AND DRUGS
- ENVIRONMENTAL CHEMICALS SUCH AS LEAD OR POLYCHLORINATED BIPHENYL (PCB)

- SOME ADDITIVES ARE GENERALLY RECOGNIZED AS SAFE (GRAS) ITEMS AND REQUIRE NO TESTING FOR SAFETY. OTHERS REQUIRE A BATTERY OF TESTS TO ENSURE THEIR SAFETY FOR USE IN CONSUMER FOODS
- NO CHEMICAL AGENT IS ENTIRELY SAFE AND NO CHEMICAL AGENT SHOULD BE CONSIDERED ENTIRELY HARMFUL

- THE SINGLE MOST IMPORTANT FACTOR DETERMINING THE POTENTIAL HARMFULNESS OR SAFENESS OF A COMPOUND IS THE RELATIONSHIP BETWEEN THE CONCENTRATION OF THE CHEMICAL AND THE EFFECT PRODUCED ON THE BIOLOGICAL MECHANISM

- THE EFFECTIVE DOSE (ED) AND THE LETHAL DOSE(LD)
- ED ENDPOINTS ARE USUALLY THERAPEUTIC EFFICACIES, SUCH AS THE DOSE TO PRODUCE ANESTHESIA OR ANALGESIA
- THE CALCULATED LD50 IS THE STATISTICALLY ESTIMATED DOSE THAT WHEN ADMINISTERED TO A POPULATION WILL RESULT IN THE DEATH OF 50% OF THE POPULATION

