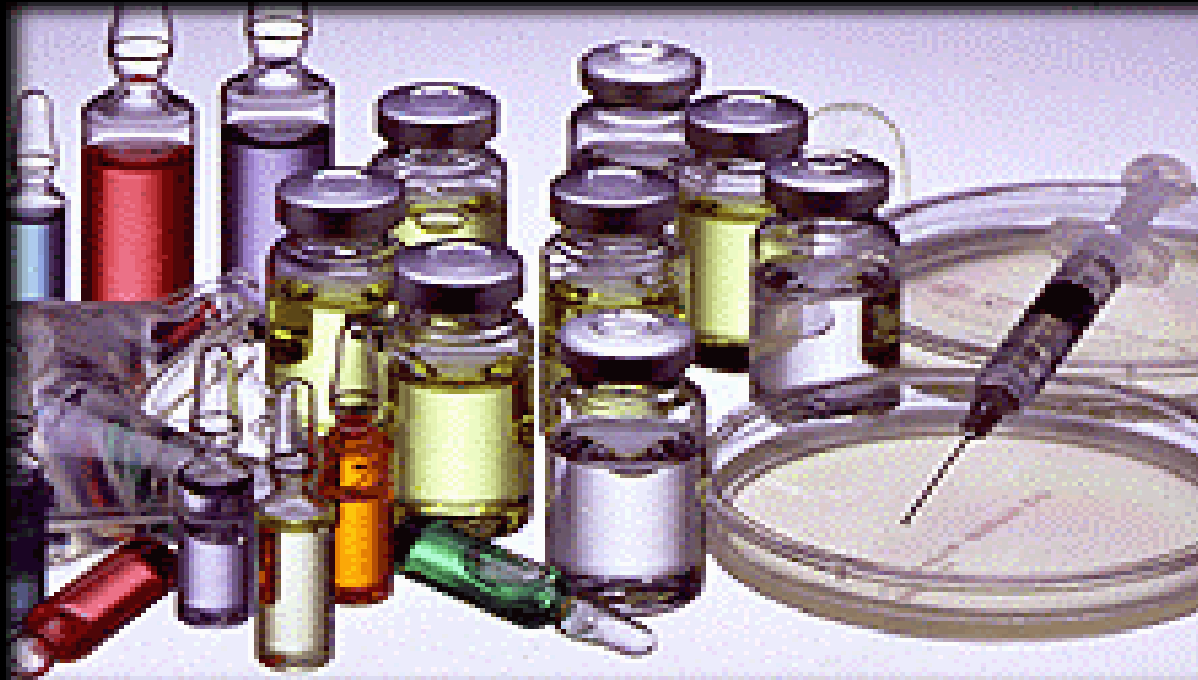




Engineering Pharmaceutical Innovation

VACCINES AND YOU

A Life Long Partnership



Overview



- Biology Lesson
- Who uses Vaccines
- What are Vaccines
- How do we make Vaccines
- Why do we use Vaccines
- The future

The WHO

Who is the Client?



- Mostly infants!!
- Boosters for toddlers
- Pre-teens
- Occasionally adults

Biology Lesson

- Avenues for application
- Ingestion vs. Injection
- Ingestion
 - Easy application
 - Anyone can do it, no special tools
 - Uses the bodies “natural” filter
- Injection
 - Difficult application
 - Need registered professional and special equipment
 - Bypasses the “natural” filter

CLIENT



The WHAT

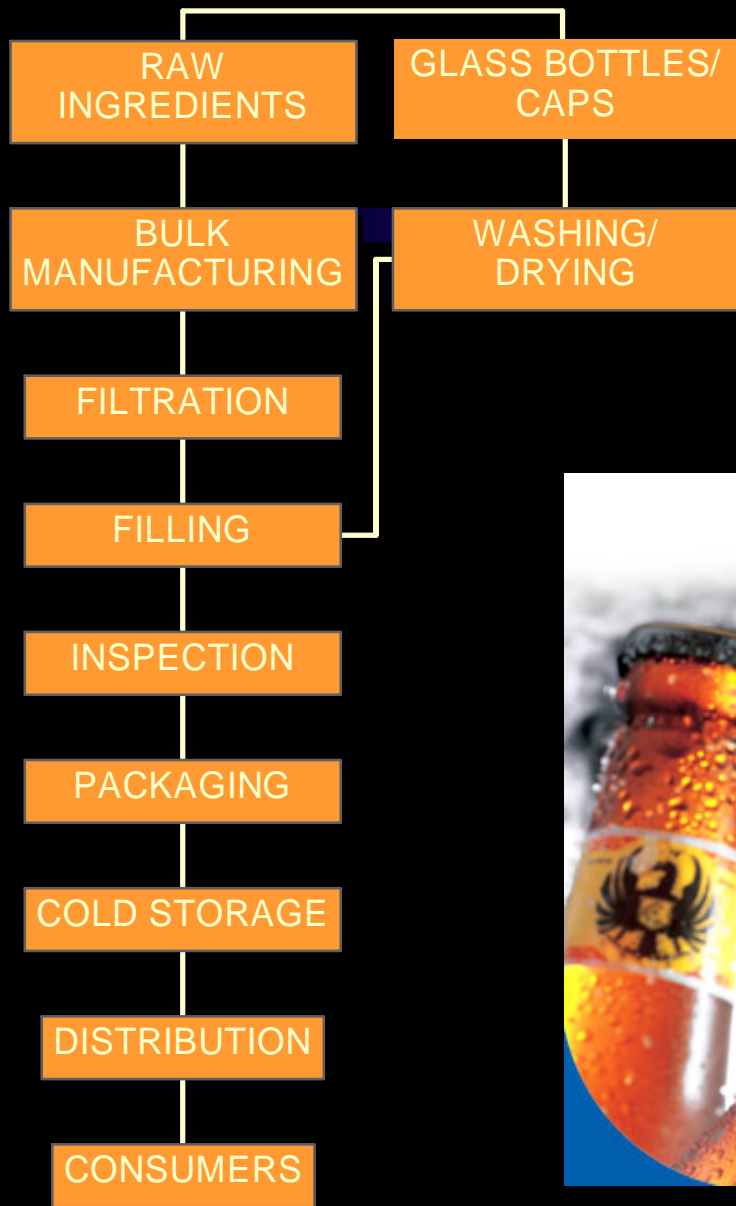
Vaccines - According to Webster

- vac·cine - n. - A suspension of attenuated or killed microorganisms, as of viruses or bacteria, incapable of inducing severe infection but capable when inoculated of counteracting the unmodified species.

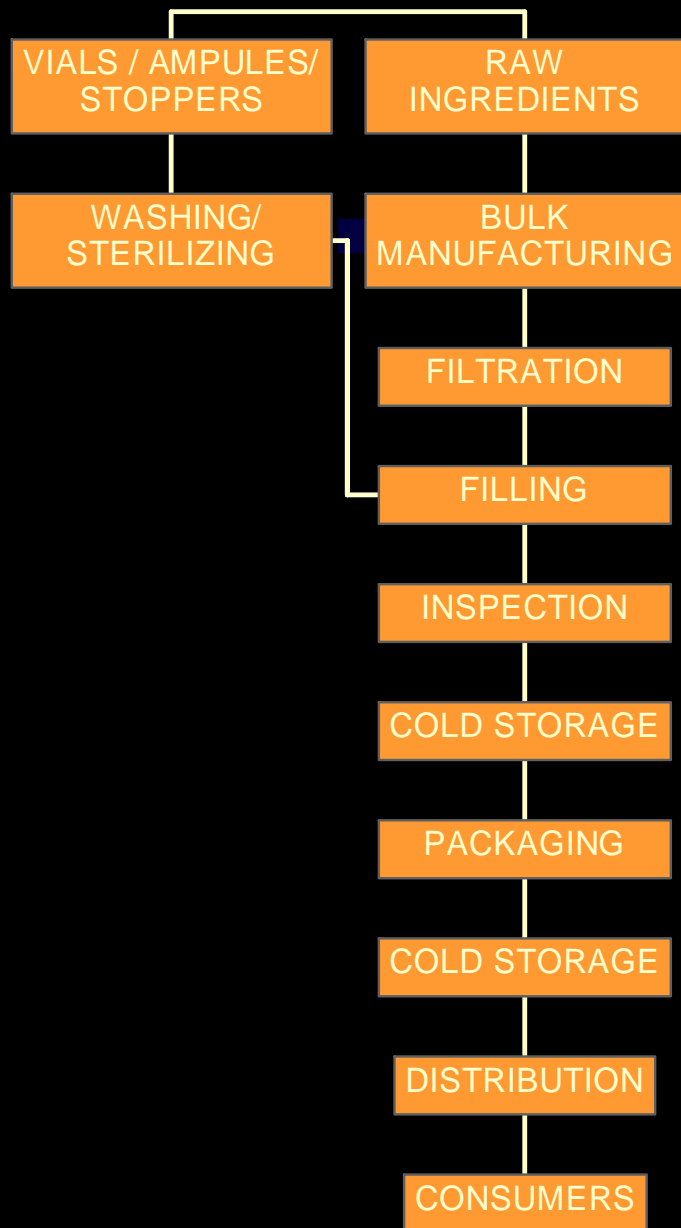
The HOW Vaccine Production

- vac·cine pro·duc·tion - v. - The appropriate combination of science, technology, equipment, facilities, human resources and artistic prowess, resulting in a product that provides life altering benefit to people worldwide.

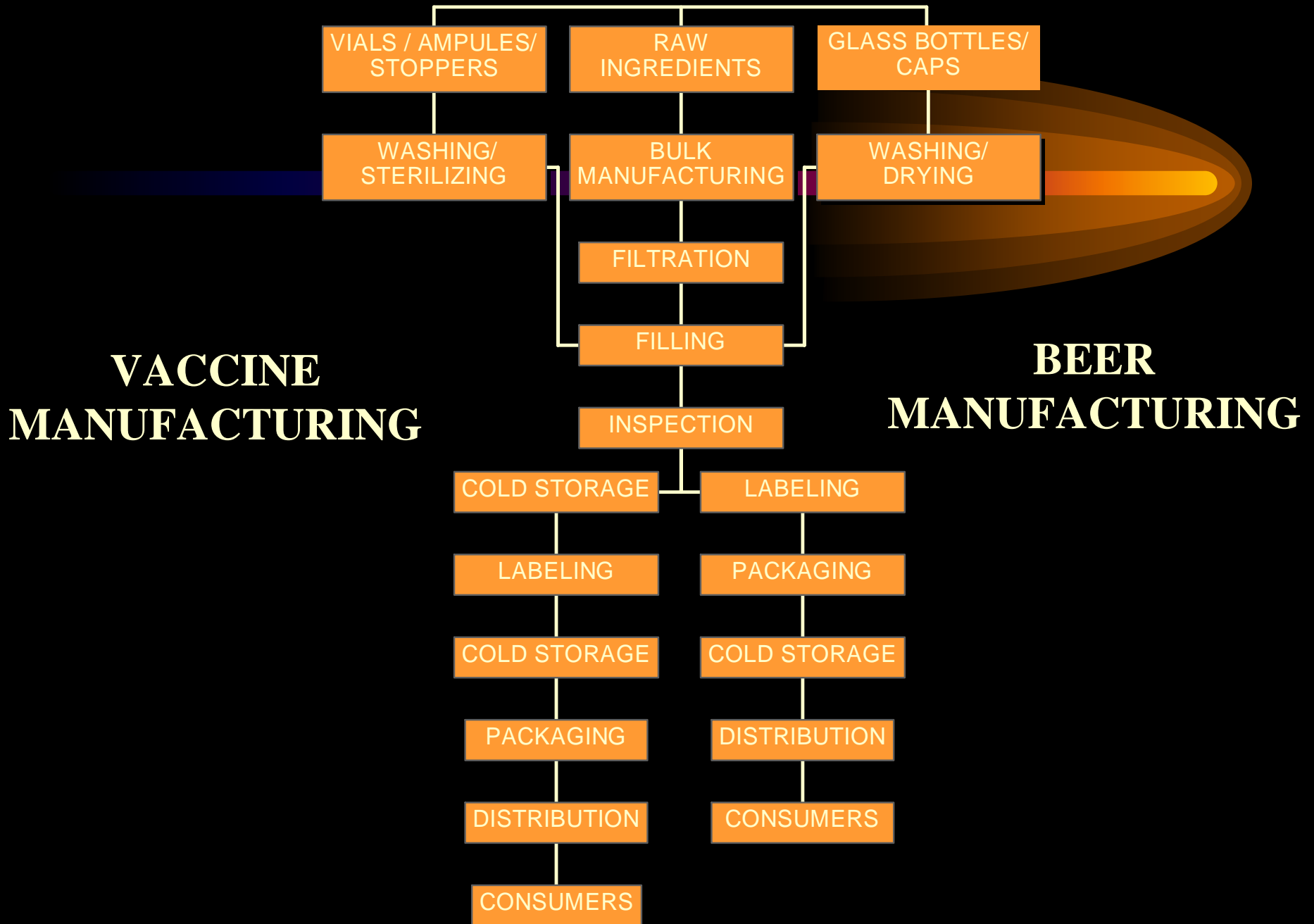
THE ART OF MAKING BEER



THE ART OF MAKING VACCINES



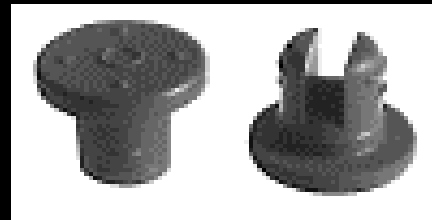
MANUFACTURING PROCESSES



What are the differences?

- Consumer/Consumer Impact
- Consequences of Tainted Product
- Cost
- Availability
- Time to Market
- Complexity and Process control
- Regulatory oversight

CONTAINER SUPPLIES



CONTAINER PREPARATION



BEER MANUFACTURING



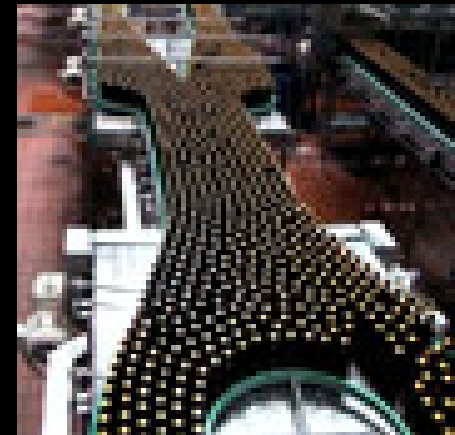
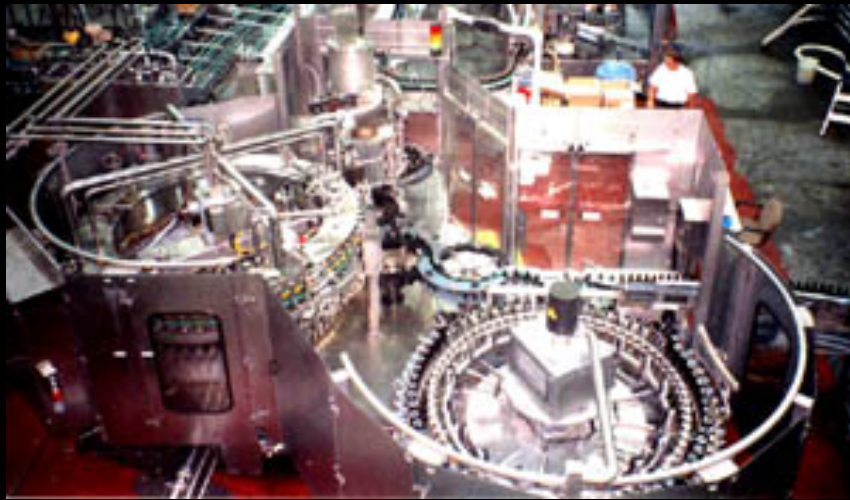
VACCINE MANUFACTURING



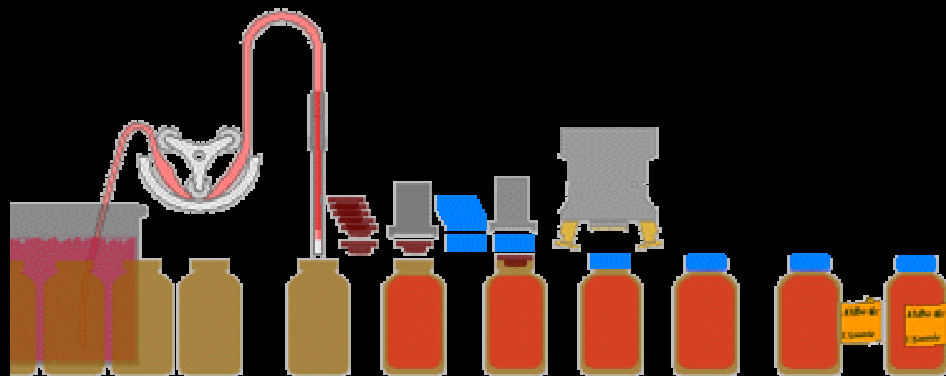
FILTRATION



BEER BOTTLE FILLING AND CAPPING



VACCINE FILLING / CAPPING



BEER BOTTLE INSPECTION



VIAL INSPECTION



PACKAGING AND LABELING



COLD STORAGE



CONSUMERS



What are the differences?

- Consumer/Consumer Impact
- Consequences of Tainted Product
- Cost
- Availability
- Time to Market
- Complexity and Process control
- Regulatory oversight

Don't forget...
This is still a business?

- Consumer/Consumer Impact
- Consequences of Tainted Product
- Cost
- Availability
- Time to Market
- Complexity and Process control
- Regulatory oversight



WHERE HAVE WE BEEN?

More importantly.....

*WHERE ARE WE
GOING?*

MEDICAL ADVANCEMENT TIMELINE

-
- 2030 - Regenerative medicine has led scientists to grow a human heart outside the body
 - 2015 - Scientists use Human germline therapy to remove hereditary diseases from embryos
 - 2001 - Germline therapy is used to help infertile women become pregnant through IVF
 - June 2000 - initial sequencing of the human genome (human blueprint) was completed
 - 1998 - Isolation of the first human embryonic stem cells at the University of Wisconsin
 - 1996 - "Dolly" the sheep became the first animal to be cloned from adult cells
 - 1990 - First somatic gene therapy was approved to treat ADA deficiency
 - 1978 - First test tube fertilized baby is born
 - 1968 - The first successful bone marrow transplant was performed at the University of Minnesota
 - 1954 - First successful organ (kidney) transplant
 - 1953 - Watson and Crick discover the structure of DNA
 - 1928 - Alexander Fleming discovers the drug Penicillin
 - 1796 - Edward Jenner administers the first officially recognized vaccination against smallpox
 - 1100s - Variolation (inoculation with live virus) for smallpox first reported in China

Langonian Physics

The Science and Art of Success

- **Langonian Rules for Successful Leadership**
 - Unequivocal honesty at all times.
 - Always treat people with dignity and respect.
 - See the future.
 - Always remember where you came from.
 - Never be afraid to ask “Why”
 - Surround yourself with absolute best people you can find.
 - Mediocrity is not acceptable.
 - Follow Einsteinian thinking to gain perspective...”Everything is relative”
 - Take responsibility, never give up and do so with enthusiasm.
 - Lead through action and commitment - your team will only be committed to the degree to which they perceive you are committed.
 - Remember leadership is most important in difficult times.... Don't panic.
 - Relentlessly protect your team.
 - Three things must always be true... it must be simple, convenient, and give you the right answer every time.
 - In every solution there are Technical points and Style points, lead with an equal balance as the style is often neglected.