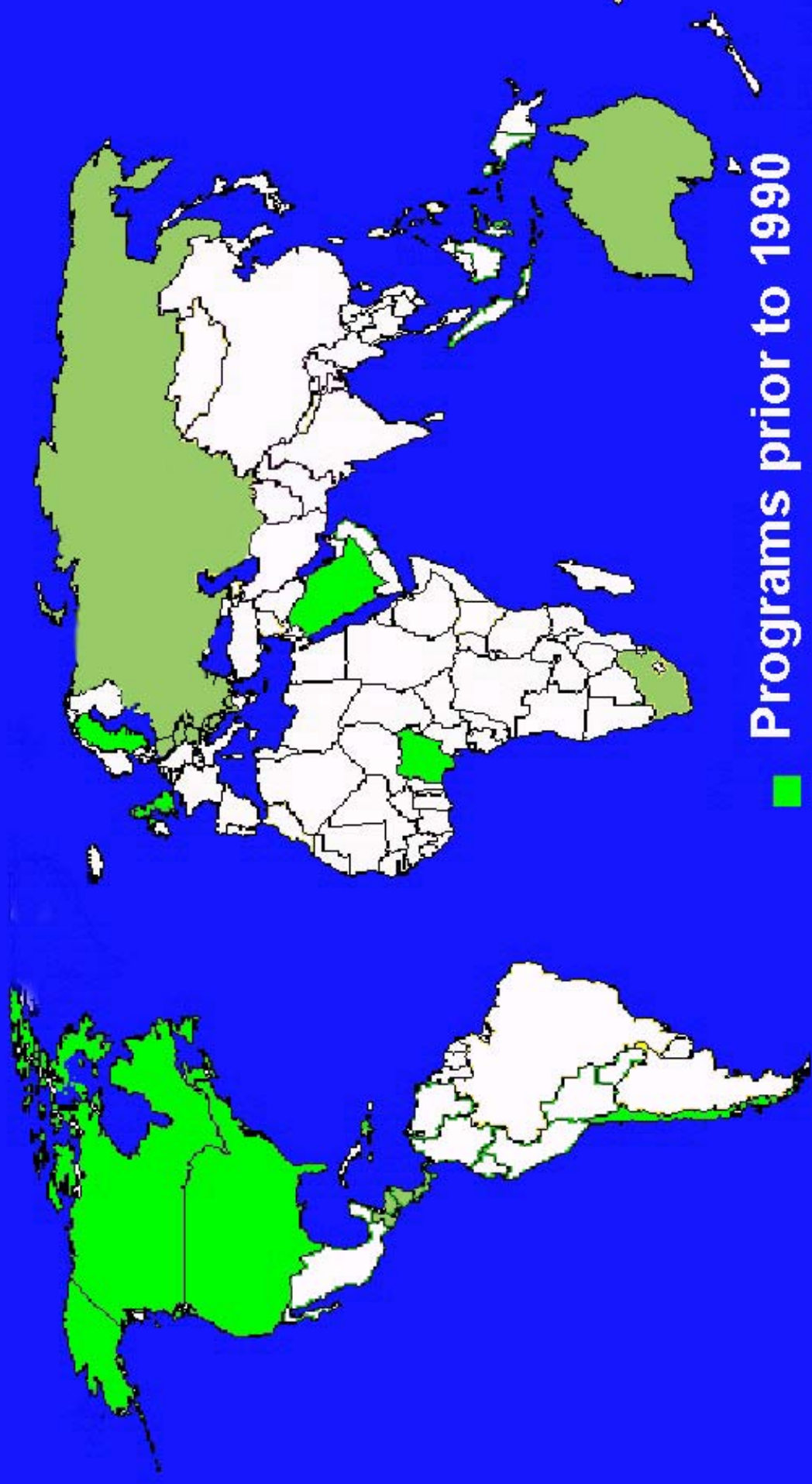


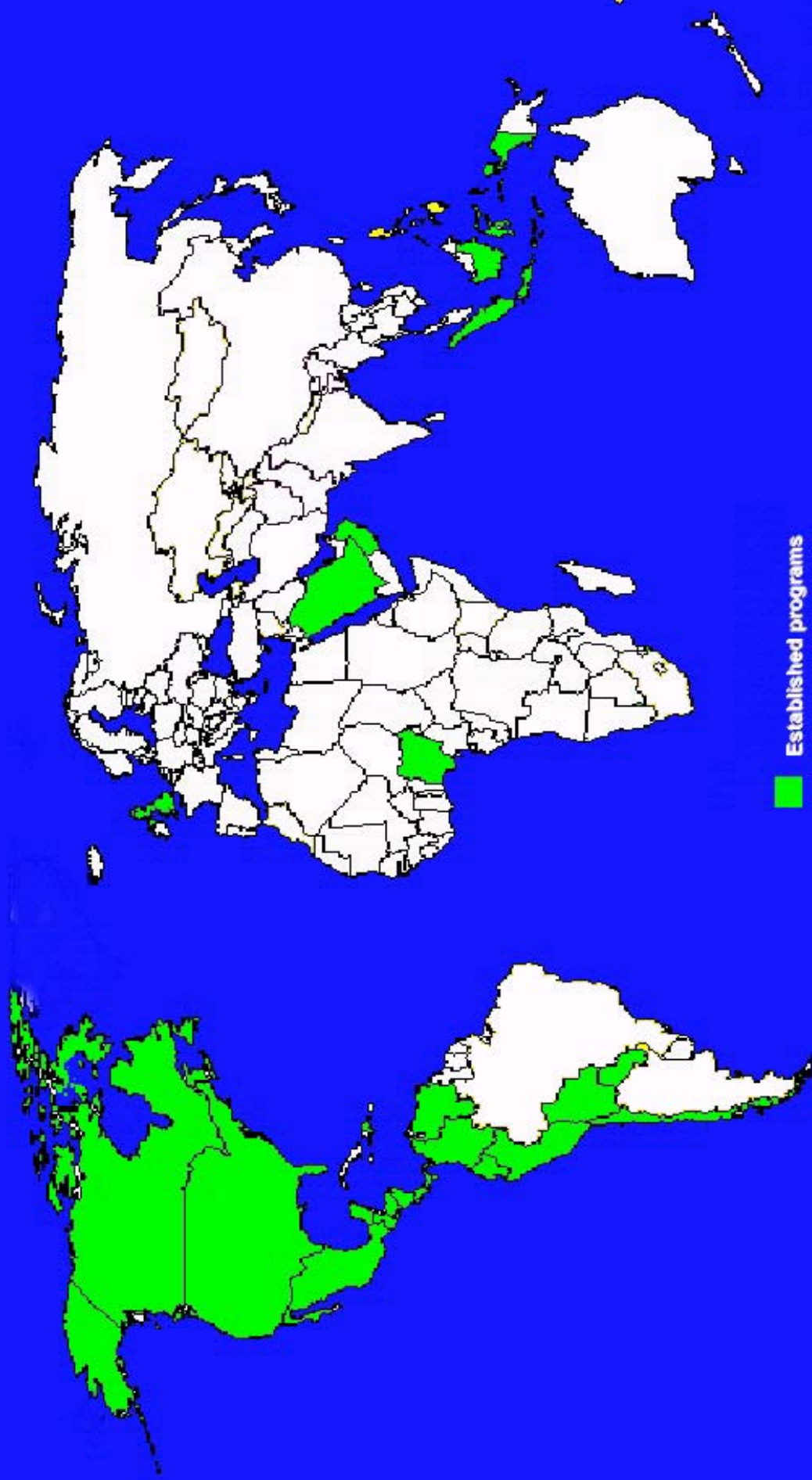
Current Practices and Recommendations on Flour and Maize Fortification

Peter Ranum

Micronutrient Initiative Consultant



■ Programs prior to 1990



Types of Micronutrients Added

■ *Basic US/Canadian Model*

- Iron
- Thiamin (Vitamin B1)
- Riboflavin (Vitamin B2)
- Niacin

■ *New Additions*

- Folic acid
- Zinc

Types of Micronutrients

- **Optional**
 - Calcium
 - Vitamin D
- **Special**
 - Vitamin A
 - Pyridoxine (vitamin B6)
- **Possible but not practiced**
 - Vitamin B12
 - Iodine
 - Selenium

Levels Added - Criteria

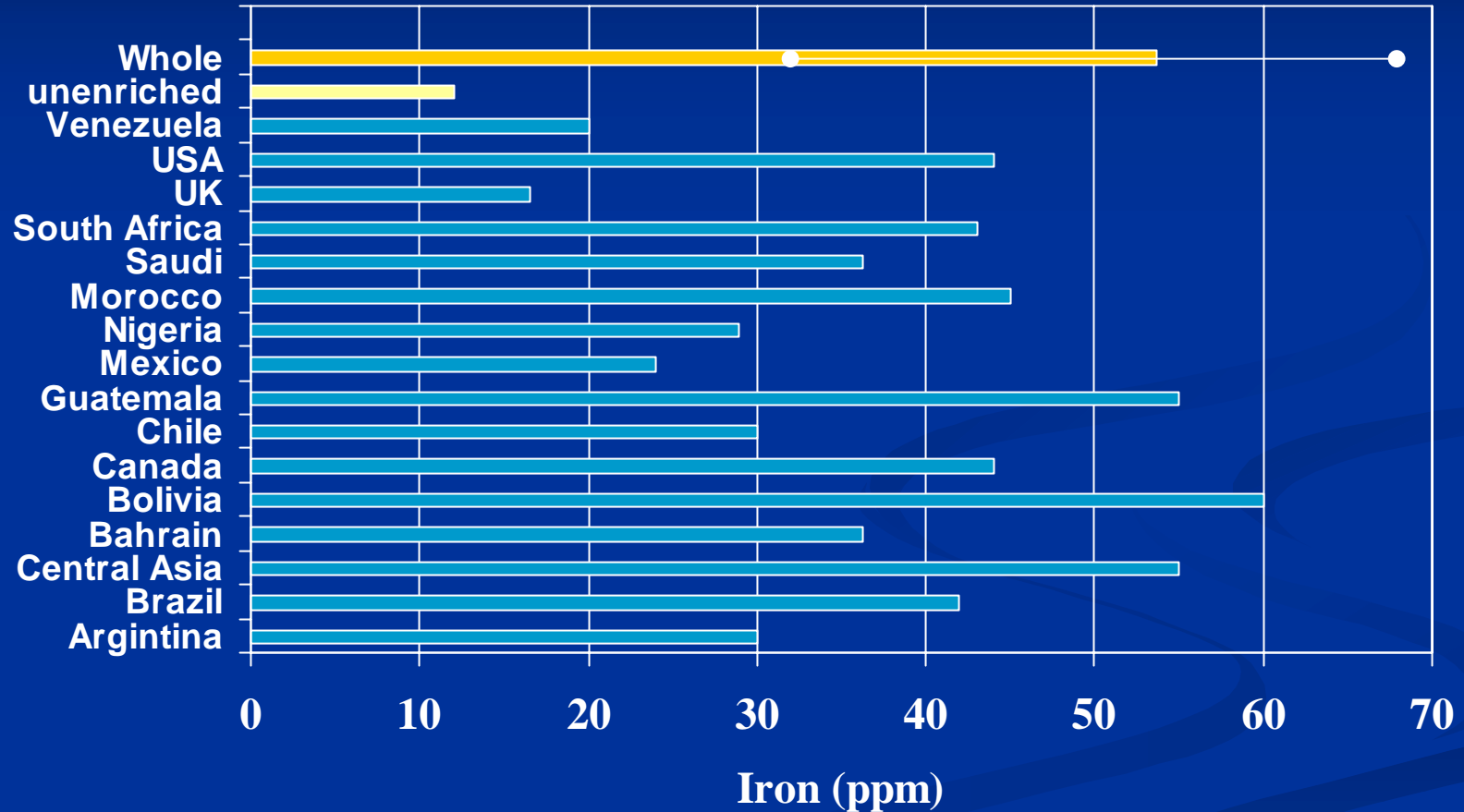
■ *Restoration (Enrichment)*

- Iron
- Thiamin
- Riboflavin
- Niacin
- Zinc

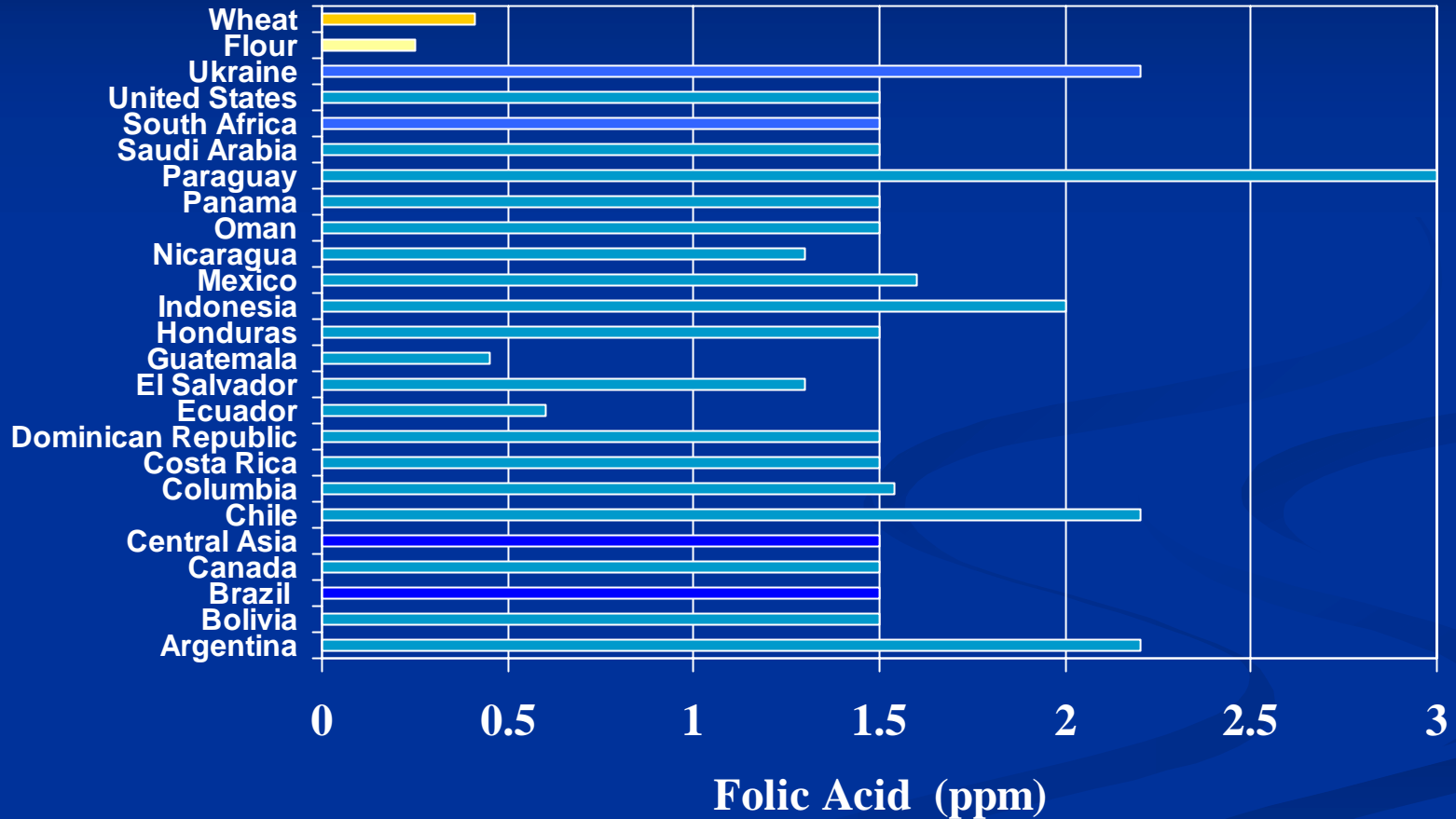
■ *Fortification*

- Folic acid
- Calcium
- Vitamin A

Iron Levels in Fortified Flour in Different Countries



Folic Acid Levels in Fortified Flour in Different Countries



Proposed levels

Neighborhood Roller Mill - Morocco



Chakki Mill - Bangladesh

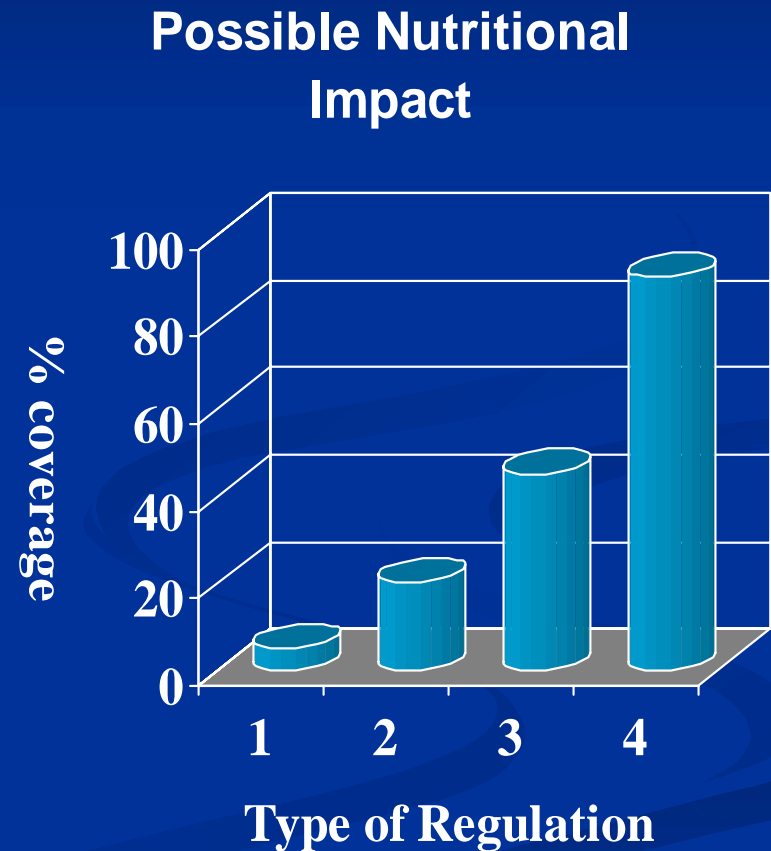


Modern Roller Mill - Indonesia

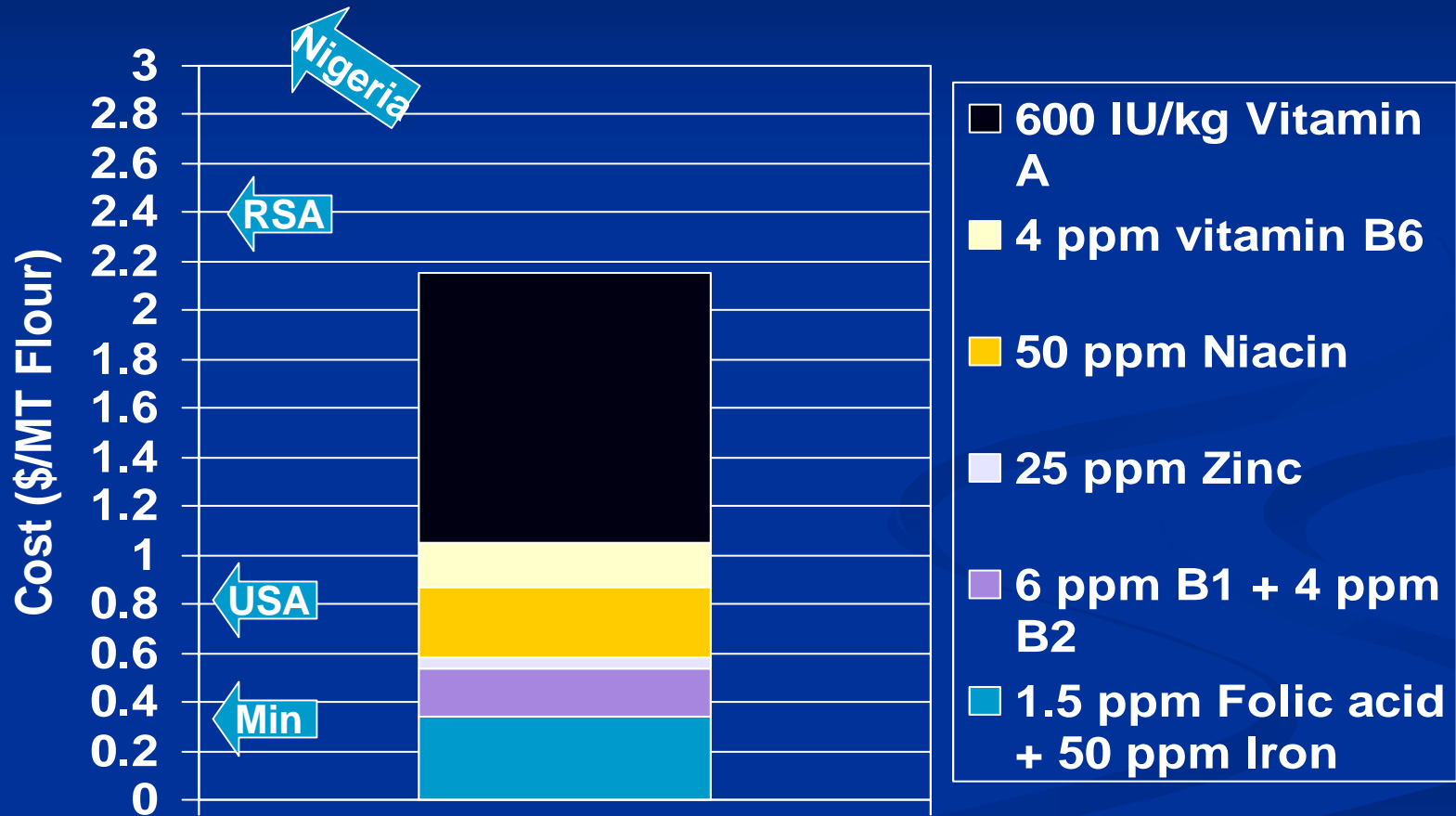


Types of Fortification Programs or Regulations

1. Allowed
2. Defined, voluntary but required only on government purchased flour
3. Defined, voluntary, regionally mandated
4. General mandatory



Premix Cost of Fortification



Recommendations

- Iron/Folic acid fortification should be minimum program in any developing country.
- Include vitamin A only if all else fails.
- Follow published guidelines on iron fortification recognizing there may be changes pending future research.
- Do not wait for perfection.