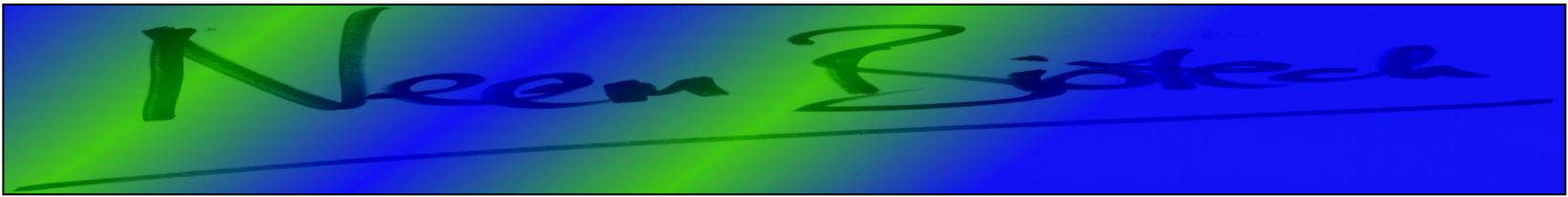




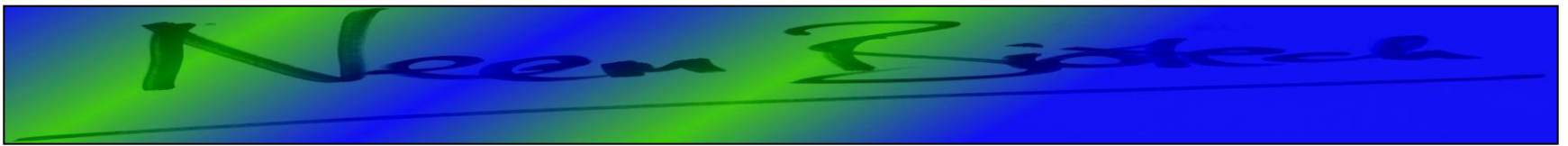
# Neem Biotech Ltd

## Application of Plant Extracts



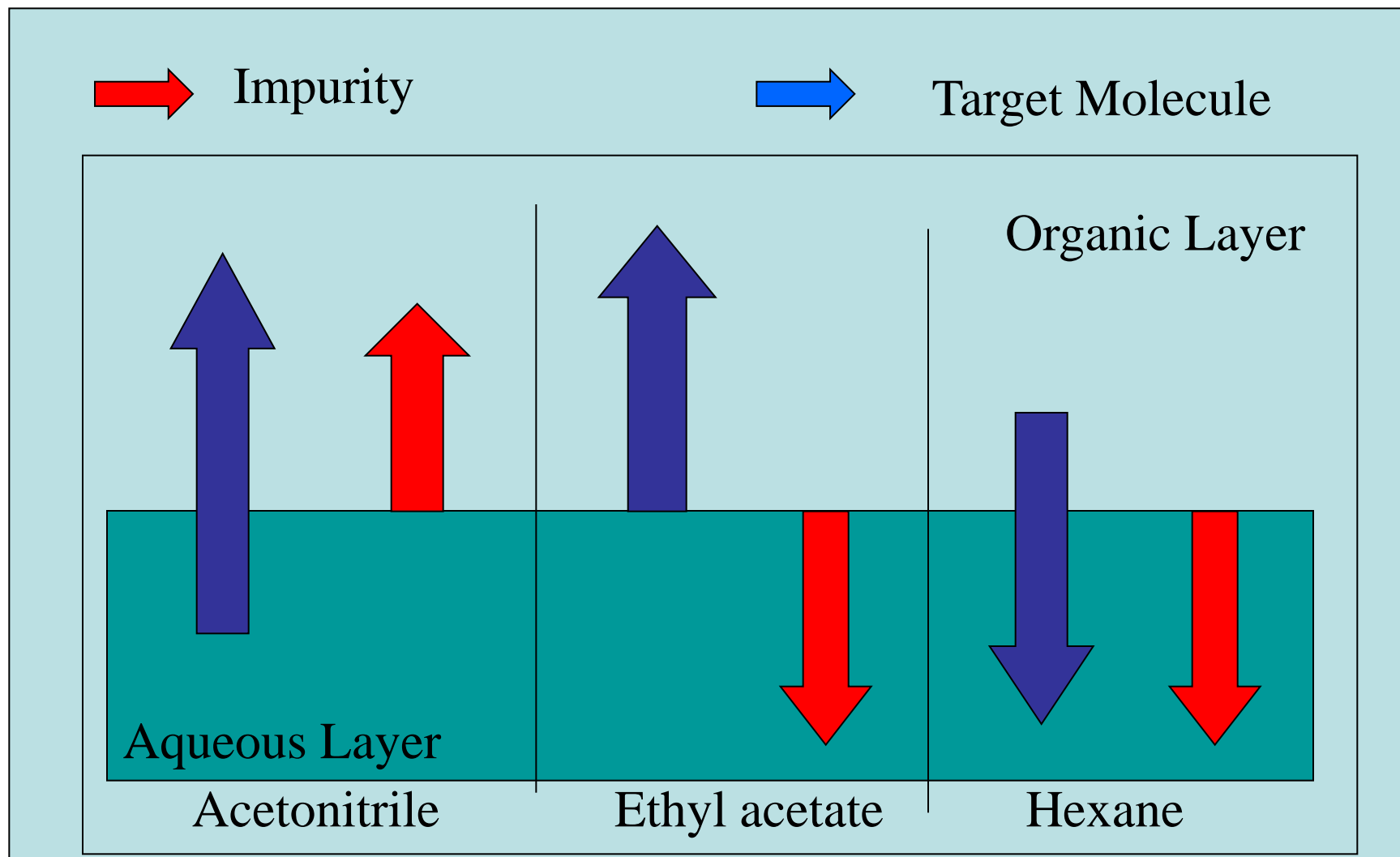
## Neem Biotech (NBT) Background

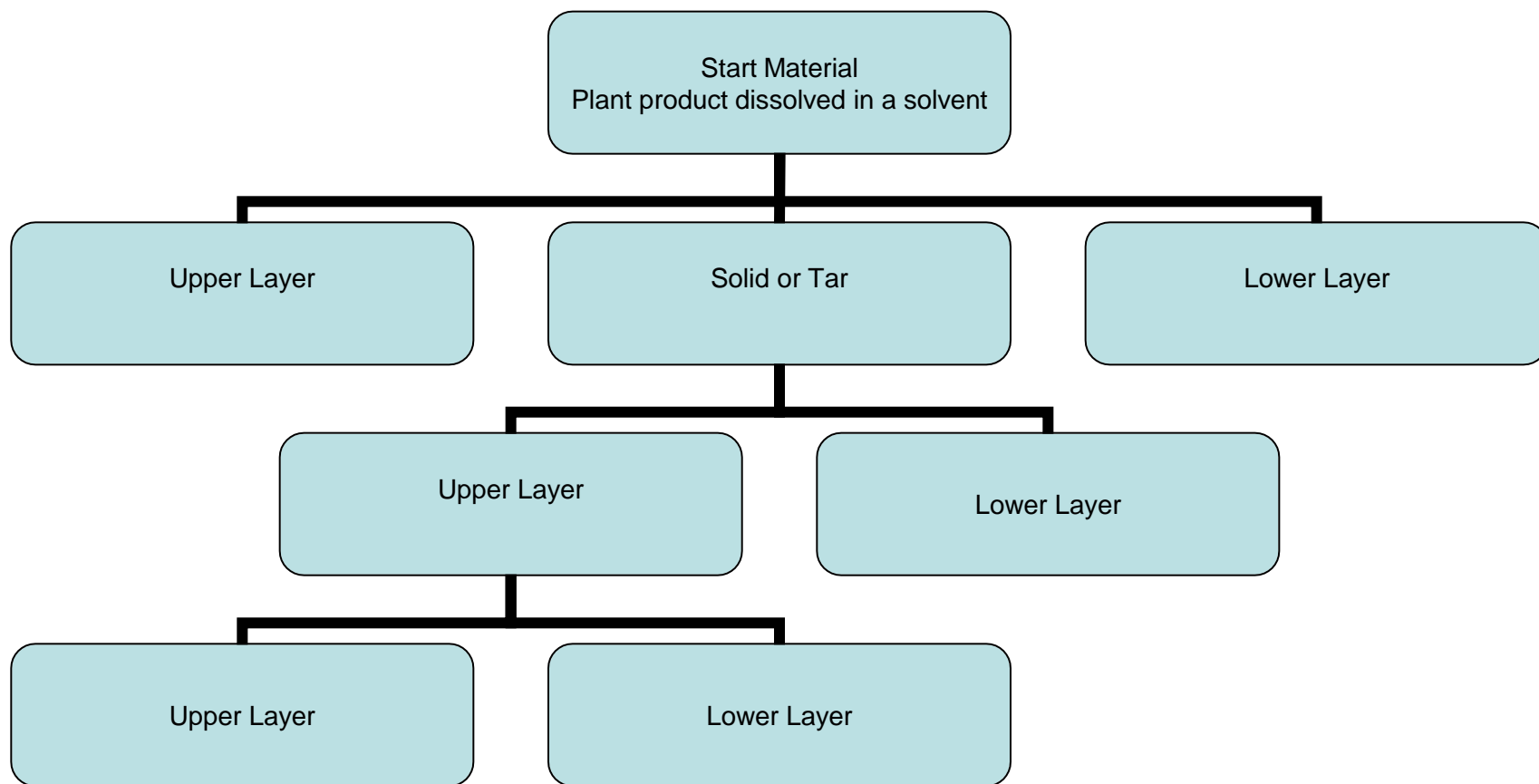
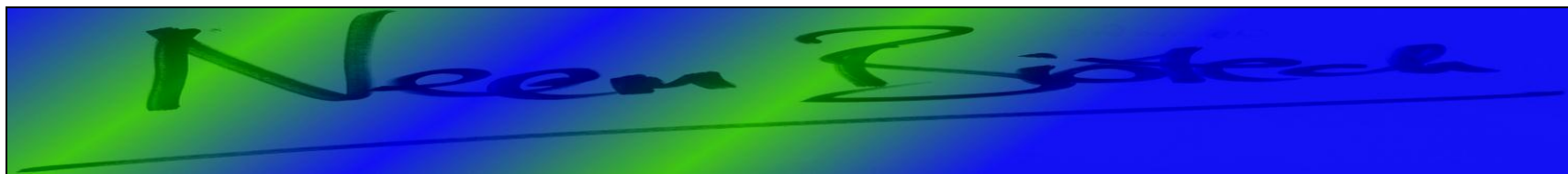
- Formed 1998
- Financed by Business Angel Investors
- Additional funding through revenue and shareholders
- Mission - to develop innovative and cost effective extraction, separation and purification processes from plant and marine material that have commercial potential
- Business Strategy - to obtain added value through revenue growth, commercial collaboration with industry/universities, patents and registration
- ISO 9001:2008 accredited

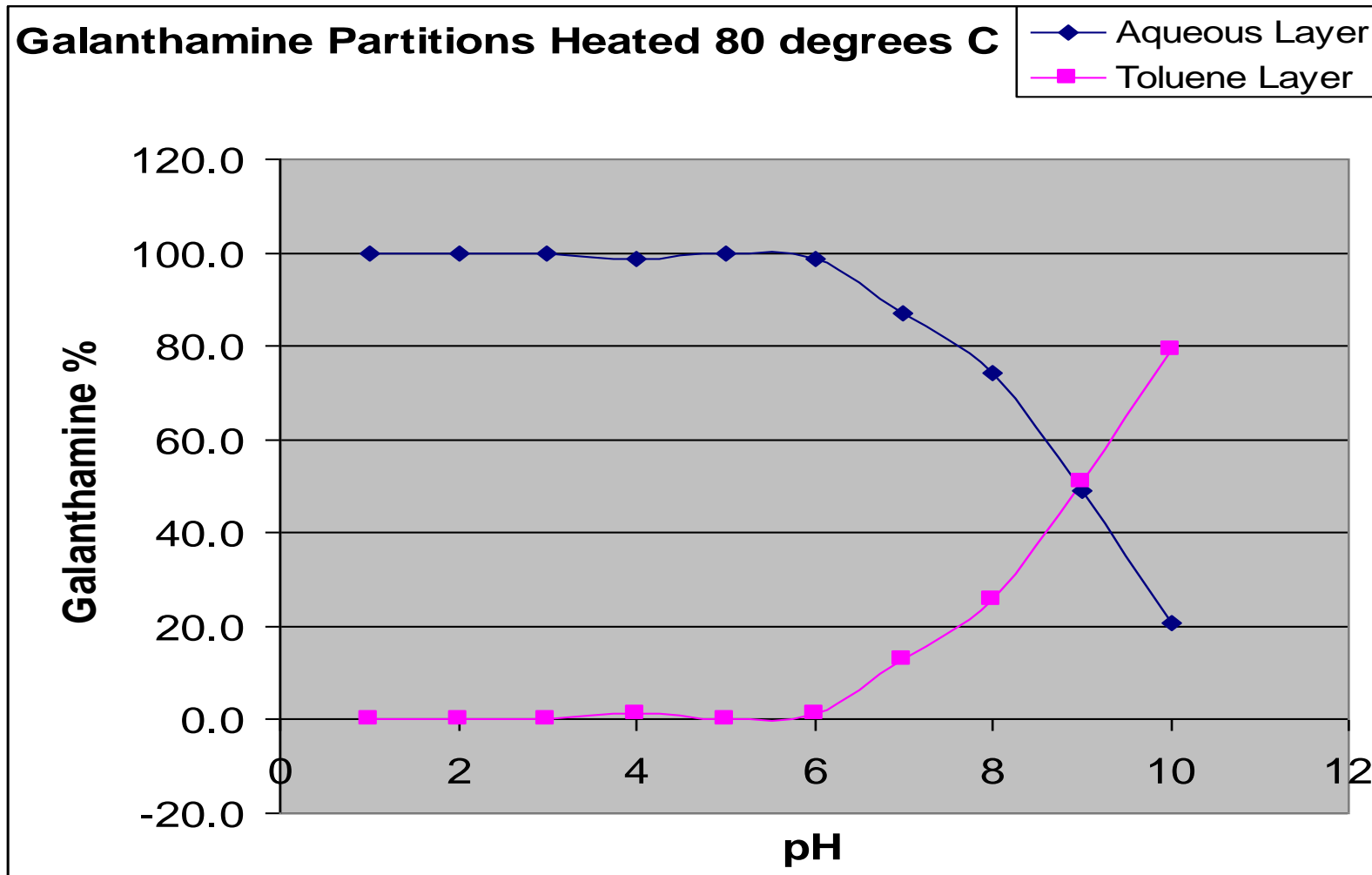
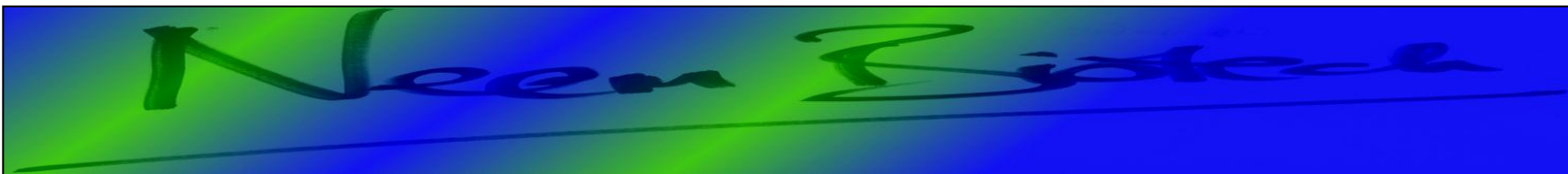


- **Examples of Successful Extractions from Plants by Neem Biotech**

- 1 **Azadirachtin** from Neem Seed Kernels **Use** Pesticide and Anti Feedant
- 2 **Allicin, Ajoene** and other polysulphides from Garlic **Use** Health Foods Antibacterial Agent
- 3 **Paclitaxel** from Yew (Taxus Canadensis) **Use** Anti cancer drug
- 4 **Artemisinin** from Artemisia Annua **Use** Malaria treatment
- 5 **Aloesin** from Aloe Ferox **Use** Skin whitener /wound healing
- 6 **Galanthamine** from Daffodil **Use** Alzheimer drug
- 7 **Harpagoside** from Devils Claw **Use** Anti inflammatory drug
- 8 **Barley Oil, Protein** from Barley **Use** Vitamin E Protein palatines
- 9 **Active compounds** from Hoodia Gordano **Use** Anti obesity drug
- 10 **Vanalin** from Peru Balsam **Use** Food flavour

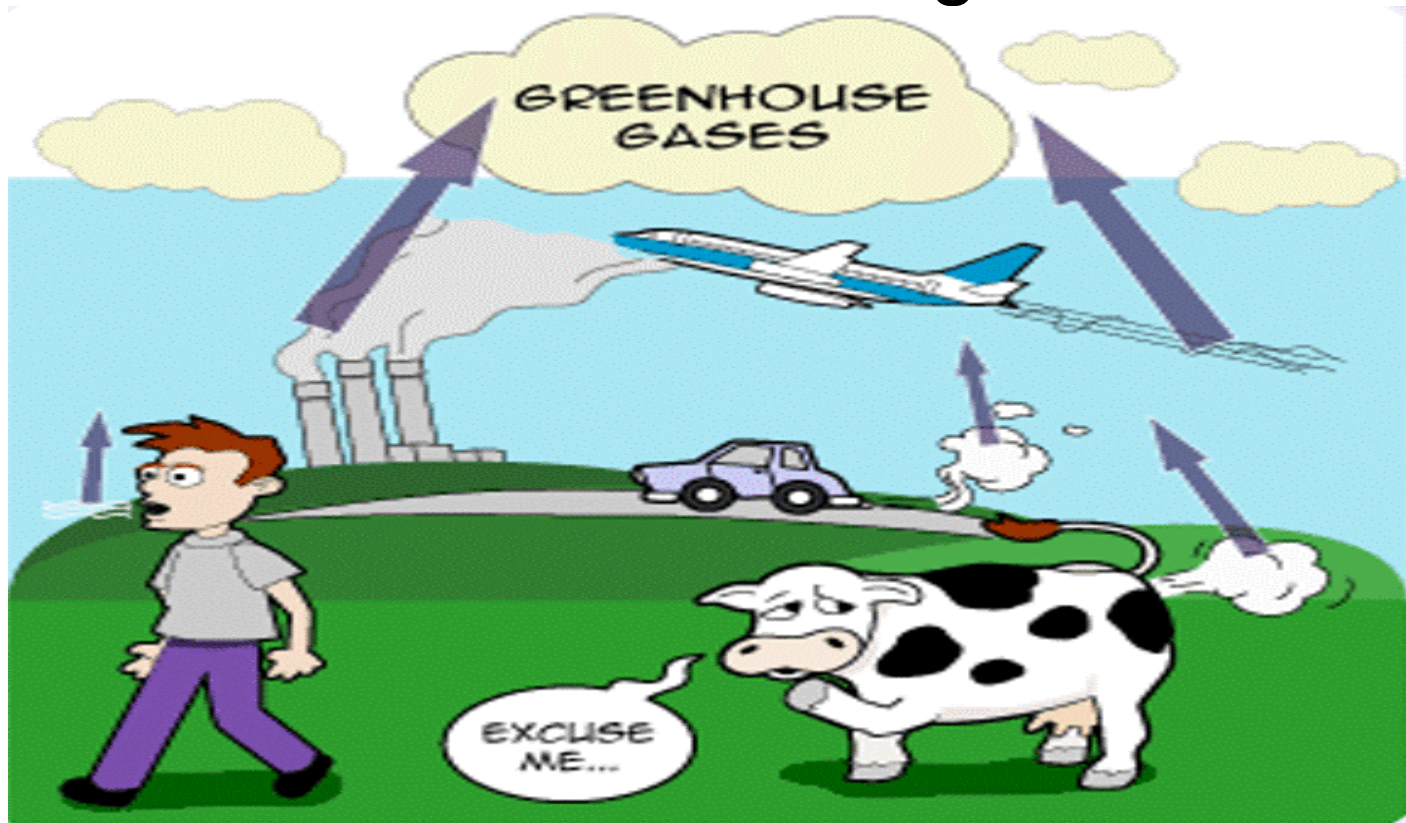






# Neem Biotech

## Climate Change



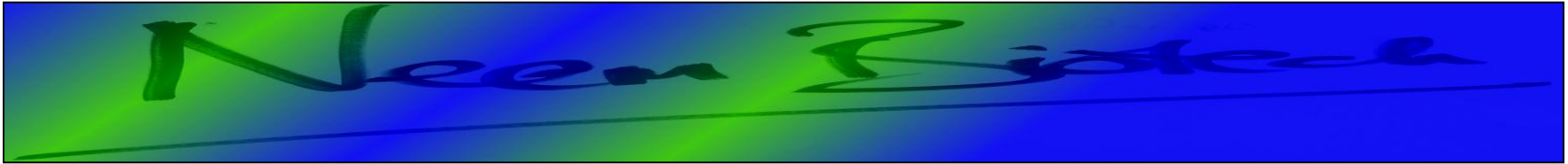


# Neem Biotech

## Neem's secret weapon





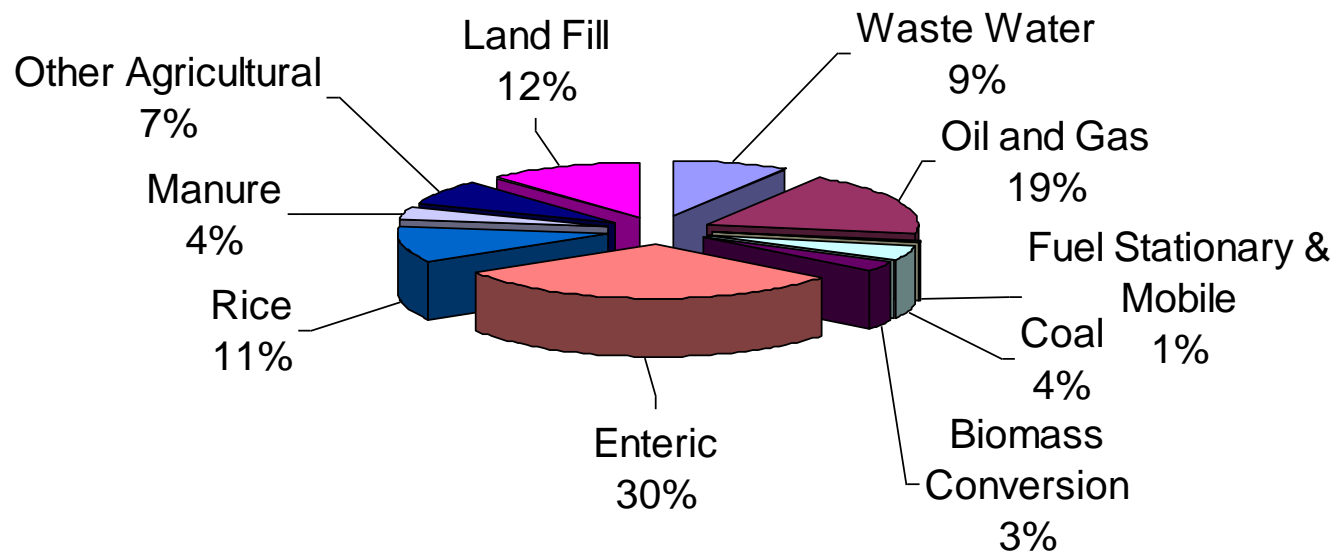


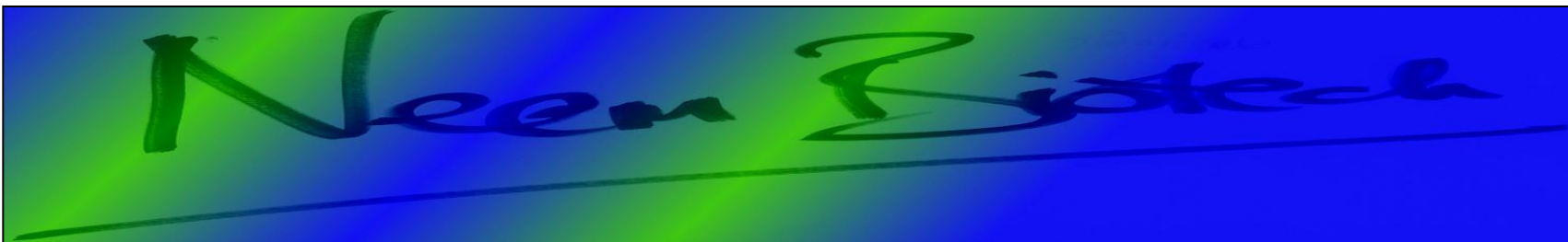
## Garlic Compounds of Interest

- Alliin – amino acid - Allicin precursor
- Allicin – Formed by action of enzyme action on Alliin – Anti microbial
- Diallyl Disulphide (DADS) – Anti Fungal
- Ajoene – Condensation from Allicin – Anti microbial anti fungal
- Vinyl Diathiin – Breakdown from Allicin Anti microbial
- Diallyl Trisulphide – Breakdown from Allicin – Insect Repellent
- Higher Polysulphides – Breakdown of Allicin - Insect Repellent

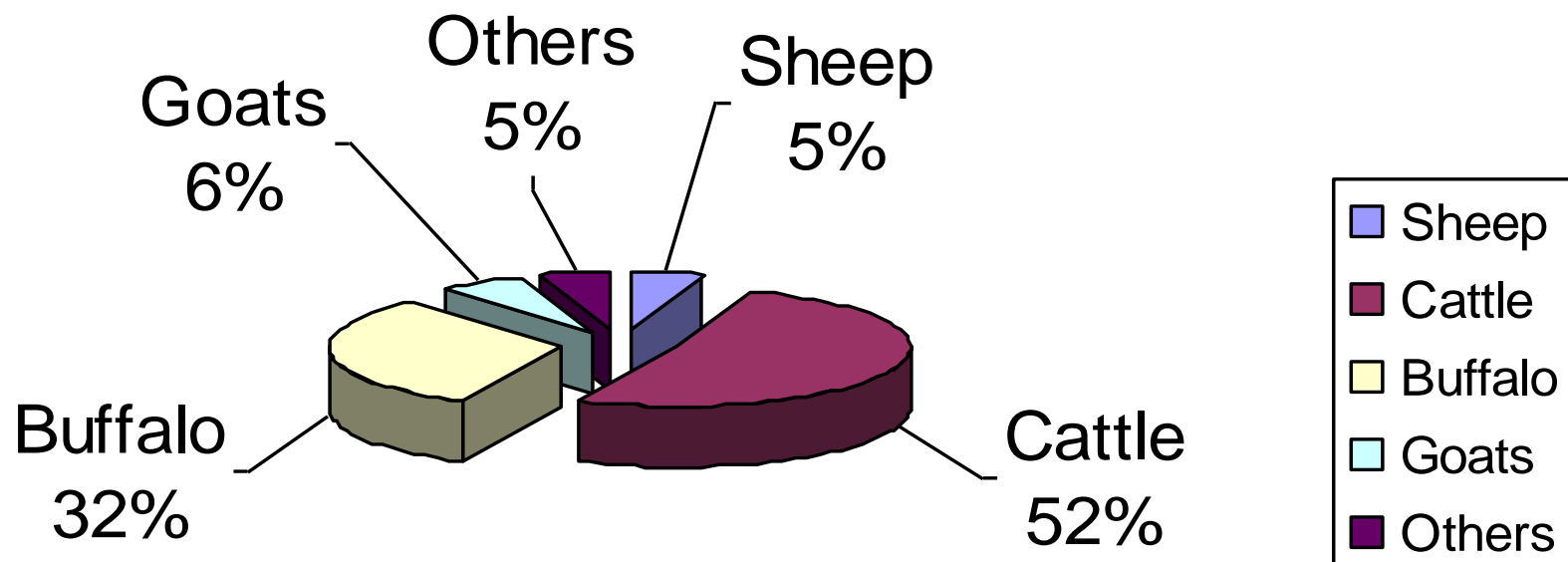


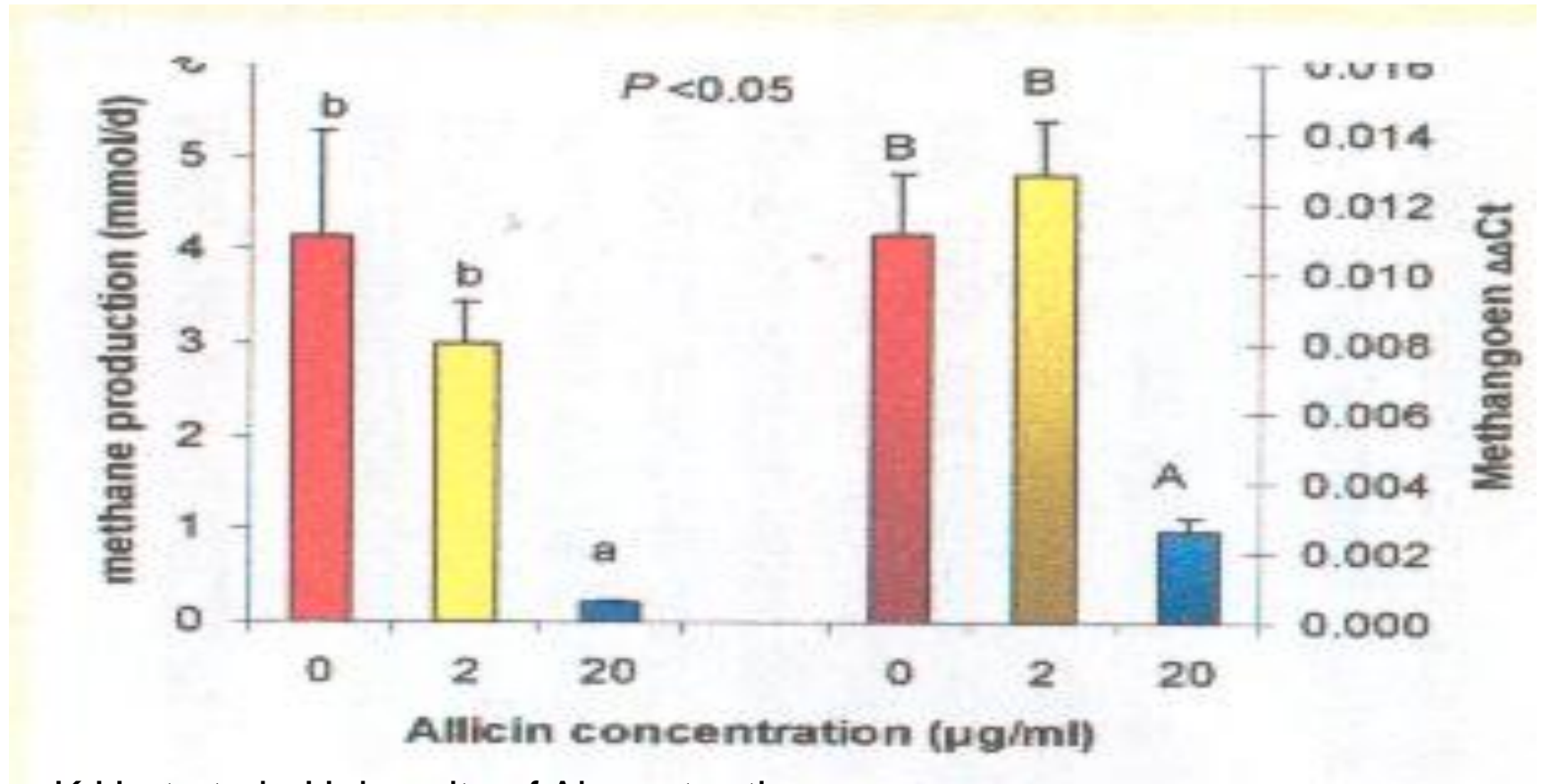
## Methane Sources 2005



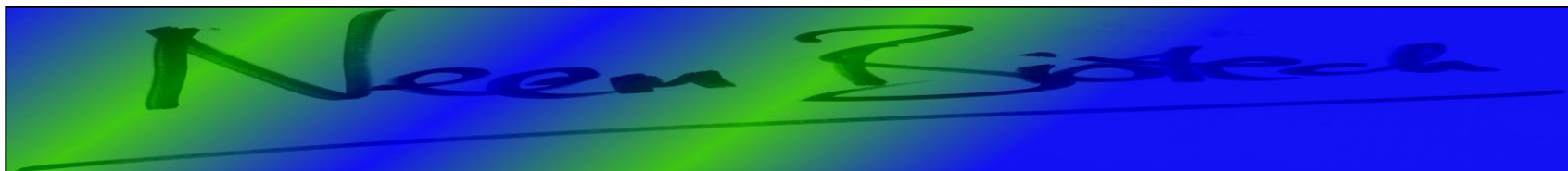


## Methane Production by Various Animals in Asia

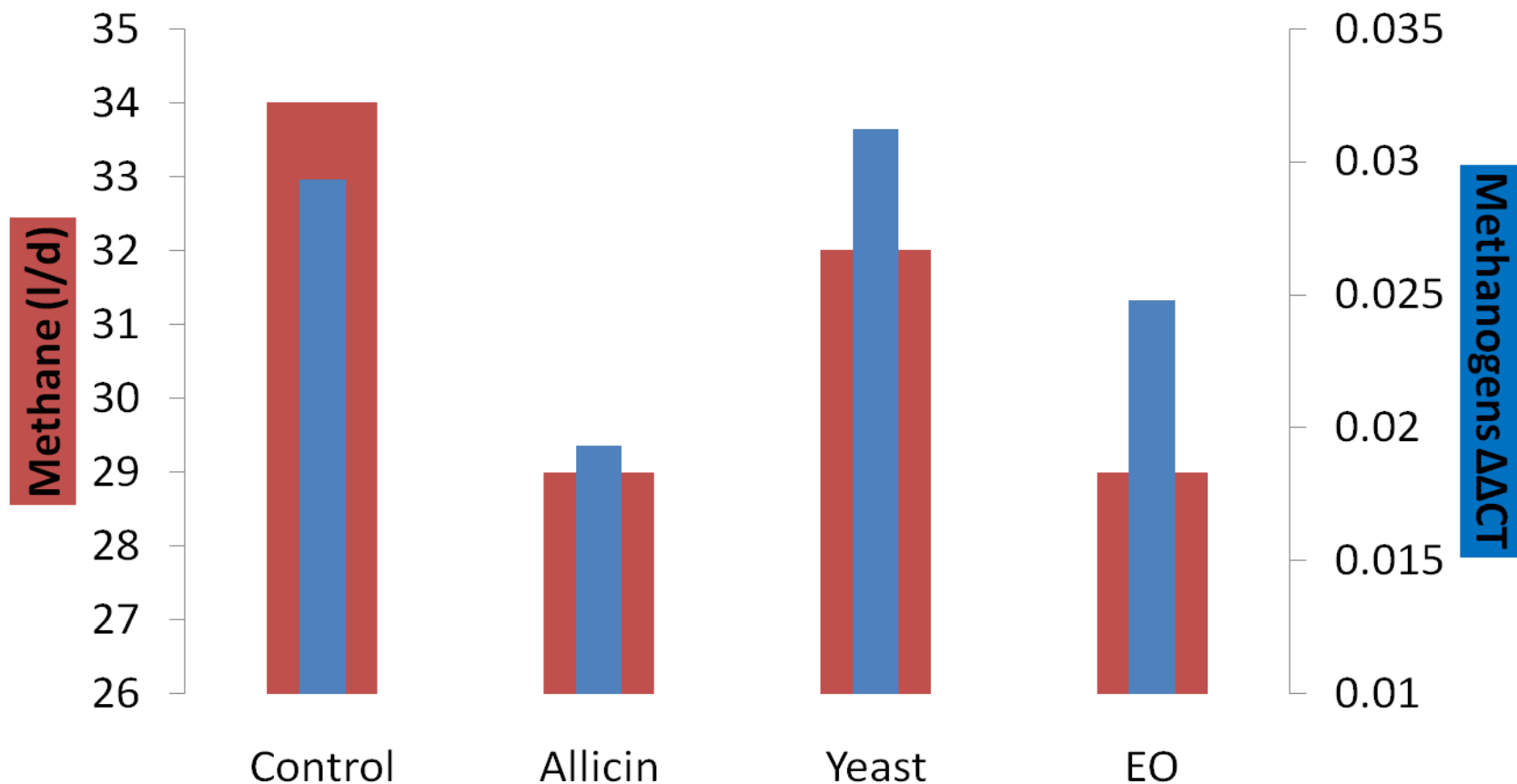


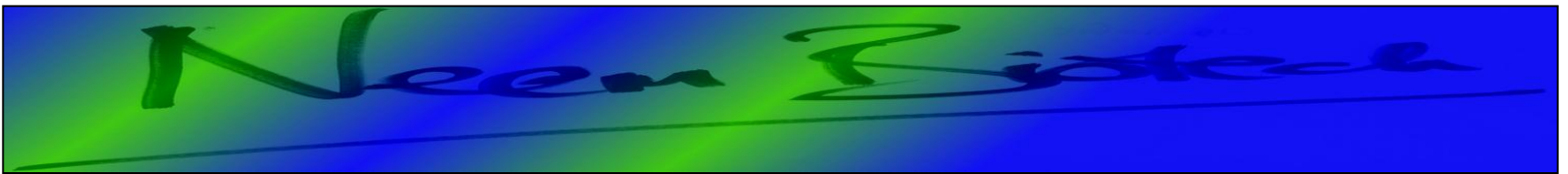


K Hart et al, University of Aberystwyth



## In vivo trials for Methane Reduction on a Std Diet + Allicin





## **Advantages of addition of Allicin to animal diets**

- Methane Reduction 15 – 25%
- Increase in conversion efficiency ~10%
- Reduction in use of Antibiotics
- Reduction of Scours in calves
- Potential to reduce incidence of mastitis
- Anti worming action
- Immune system boost & resistance to bovine TB





- Green Competitions
  - Financial Times Climate Challenge Competition
    - Finished second out of 300+
  - Post Code Lottery Green Challenge
    - One of Last 6
  - World Challenge Competition
    - One of Final 12 out of 1000+



- Thank you for your attention

## Methane Abatement Options

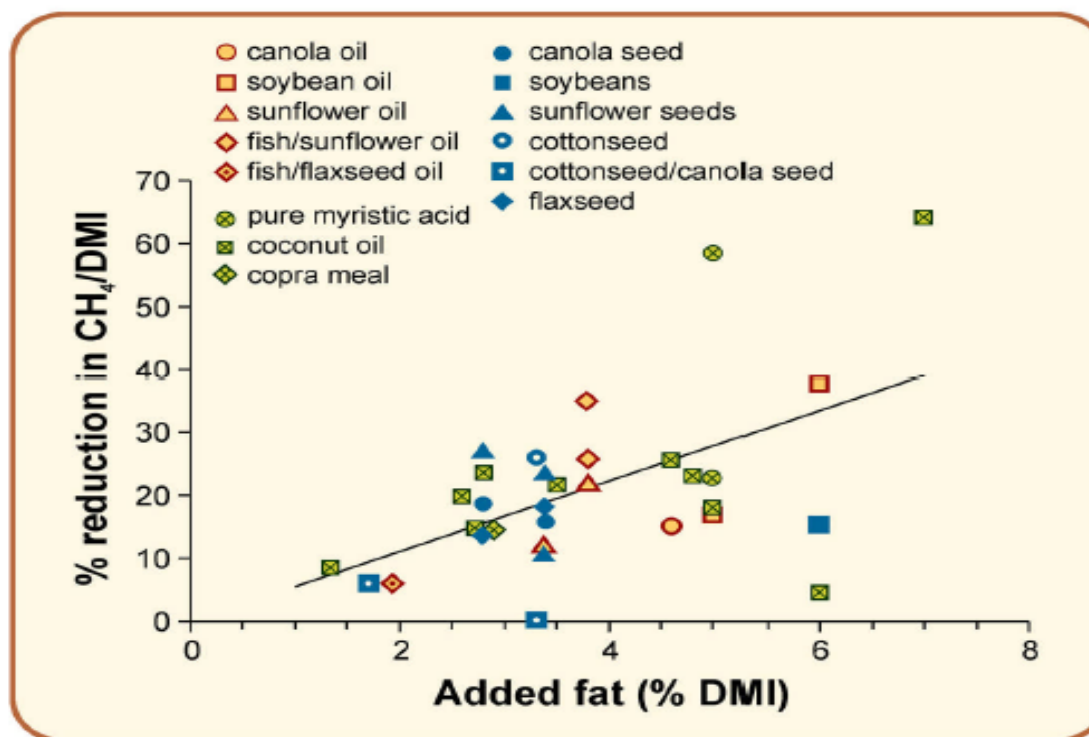
- Improving Animal Genetics
  - Differences between cows of similar genetics:
    - 250 to 450 g methane/cow/day
  - Evaluate high & low FCE (20%?)
- Nutrition and Feed management
  - Spring pasture 270 - 350 g methane/cow/day
  - Summer pasture 370 - 450 g methane/cow/day
  - Quality and digestibility of feed (25%?)
- Animal Management
  - Reducing unproductive animal numbers
    - eg. Extended lactation - 15% potential methane reduction
- Energy in methane lost = 4.4 L (318 g MS)/day
  - A 20% reduction in methane can mean 1.5L /cow.day



Richard Eckard, *Greenhouse in Agriculture*, The University of Melbourne and Department of Primary Industries

## Literature summary of added fat vs CH<sub>4</sub> production

$$Y = 5.562 \text{ (SE} = 0.590) \times \% \text{ added fat; } r^2 = 0.67; P = 0.004$$



Beauchemin, Kreuzer, O'Mara and McAllister, 2008