

Presenting Code 2

CODE OF GOOD MANUFACTURING PRACTICES (CoP)

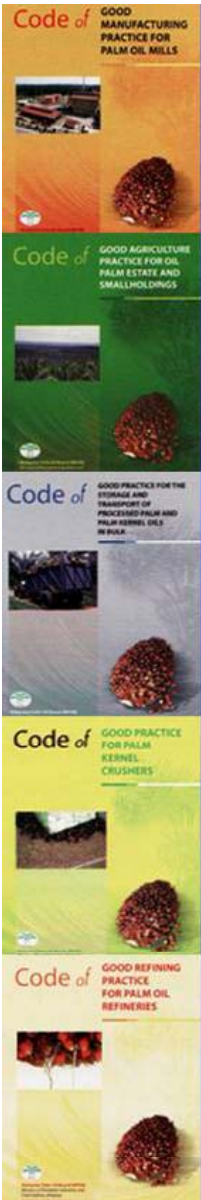
For Palm Oil Mills

By Ir. N.Ravi Menon,

MPOB

Lembaga Minyak Sawit Malaysia • Malaysian Palm Oil Board





1. WEIGHING BRIDGE

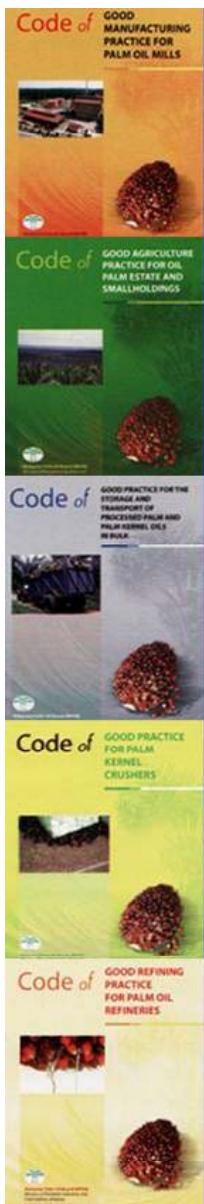
1	Scope	Food Product Application
2	Objective	Maintain accuracy
3	Principles	Average error < 0.3%
4	Criteria	Yearly calibration & certification
5	Indicators	Document related data
6	Verifiers	Audit-internal/external





2. FFB Hoppers & Apron

1	Scope	Food Product Application
2	Objective	Unload FFB in hopper <u>not on apron</u> . Keep them clean. First in first out
3	Principles	Prevent bruising of bunches & FFA rise. Food safety-cleanliness
4	Criteria	FFA<5% Visual inspection, CCTV
5	Indicators	Documentation of FFA analyses
6	Verifiers	Audit-internal/external



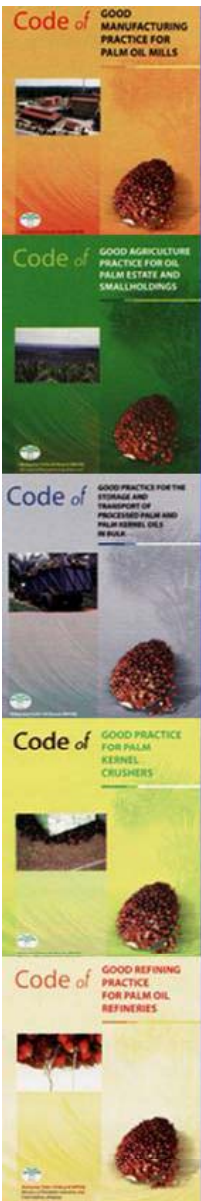
3. FFB GRADING

1	Scope	Food Product Application
2	Objective	Receive only good quality FFB
3	Principles	To ensure good extraction and quality products
4	Criteria	FFA < 5%, DOBI > 2.3% in CPO. Reject off-quality crop, loose fruits >8%, zero contamination in FFB
5	Indicators	Production book, Lab records, buyer's data on quality.
6	Verifiers	Audit-internal/external

4. FFB UNLOADING FACILITY

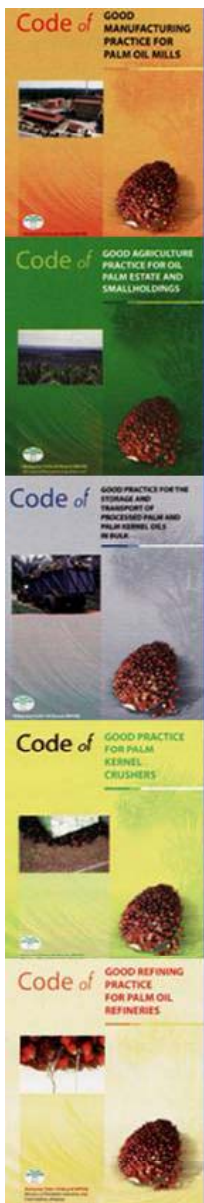
1	Scope	Food Product Application
2	Objective	Prevent bruising of FFB
3	Principles	Ensure hopper space for FFB storage
4	Criteria	Minimum 8 hours storage space
5	Indicators	CCTV Zero dumping on hopper apron
6	Verifiers	Audit-internal/external





5. CAGE FILLING

1	Scope	Food Product Application
2	Objective	To prevent spillage resulting in bruising of fruits.
3	Principles	Bruising results in a rise in FFA- CPO quality deterioration
4	Criteria	Single point filling reduces this
5	Indicators	Routine inspection for spilled fruit
6	Verifiers	Audit-internal/external



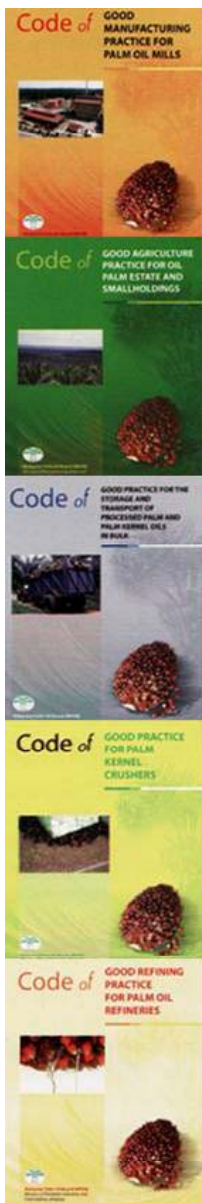
6. CAGE MATERIAL

1	Scope	Food Product Application
2	Objective	Prevent iron & copper contamination of CPO by using Stainless steel material
3	Principles	Mild steel causes oxidation of CPO
4	Criteria	Quality deterioration of CPO
5	Indicators	DOBI analyses of CPO
6	Verifiers	Audit-internal/external



7. STERILIZER CONSTRUCTION/ DESIGN

1	Scope	Food Product Application
2	Objective	Prevent iron contamination by lining sterilizer with s/s or ceramic material
3	Principles	Iron in CPO promotes oxidation
4	Criteria	Quality deterioration of CPO
5	Indicators	DOBI value of CPO
6	Verifiers	Audit-internal/external



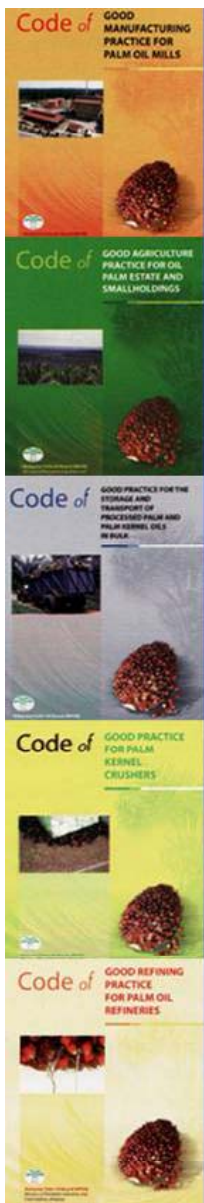
8. STERILIZATION.

1	Scope	Food Product Application
2	Objective	To ensure by good de-aeration by continuous bleeding of condensate
3	Principles	Air is an insulator that prevents heat transfer into bunches
4	Criteria	To ensure 100% FFB stripping.
5	Indicators	Stripping efficiency- % Un-stripped bunches
6	Verifiers	Audit-internal/external



9. STERILIZATION CONDENSATE

1	Scope	Food Product Application
2	Objective	Stop sterilizer condensate recycling to prevent CPO contamination
3	Principles	To reduce oxidation of CPO
4	Criteria	To maintain quality of CPO
5	Indicators	DOBI check and metal content in CPO
6	Verifiers	Audit-internal/external



10. STERILIZED BUNCH ELEVATOR

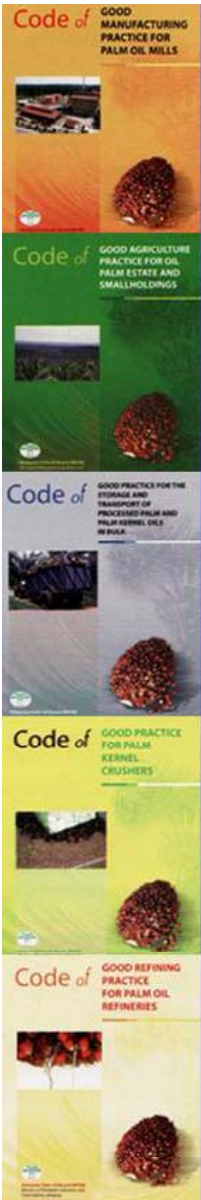
1	Scope	Food Product Application
2	Objective	To prevent fruit contamination with grease
3	Principles	Grease/lubricant contamination lowers the quality of CPO
4	Criteria	Grease is hydro carbon not allowed in food products unless vegetable based.
5	Indicators	Test for hydro carbon contamination
6	Verifiers	Audit-internal/external





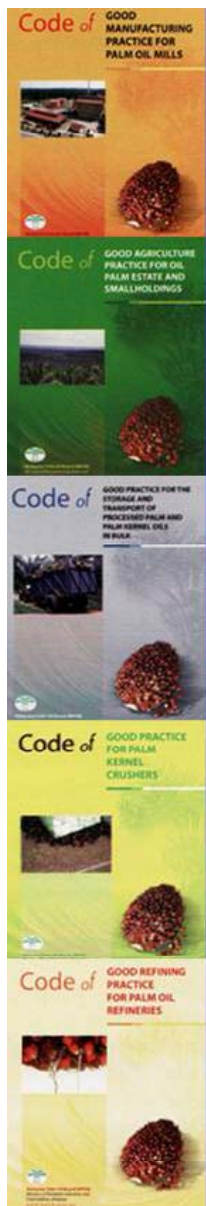
11.OVERHEAD HOIST/ TIPPER/THRESHER		
1	Scope	Food Product Application
2	Objective	To prevent fruit contamination with grease
3	Principles	Grease/lubricant contamination lowers the quality of CPO
4	Criteria	Grease is hydro carbon not allowed in food products unless vegetable based.
5	Indicators	Test for % hydrocarbon in CPO
6	Verifiers	Audit-internal/external





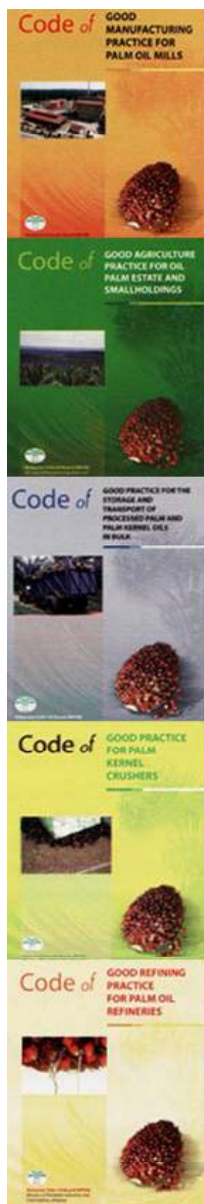
12. DIGESTER CONSTRUCTION

1	Scope	Food Product Application
2	Objective	Prevent iron contamination by lining digester with s/s or ceramic material
3	Principles	Iron in CPO promotes oxidation
4	Criteria	Enhance quality of CPO
5	Indicators	DOBI value of CPO
6	Verifiers	Audit-internal/external



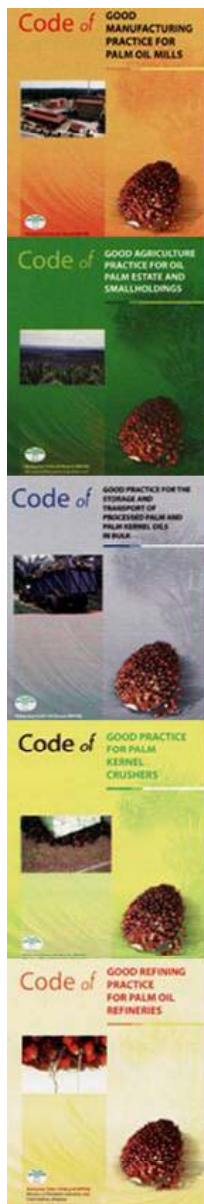
13.DIGESTION OPERATION

1	Scope	Food Product Application
2	Objective	Maintain $\frac{3}{4}$ full, Least gap between arms and the body, temperature $>90^{\circ}\text{C}$. Ensure maximum digester drainage
3	Principles	For good digestion-promotes cell rupture, reduce oil loss
4	Criteria	Extract maximum oil- minimum oil loss
5	Indicators	Lab tests
6	Verifiers	Audit-internal/external



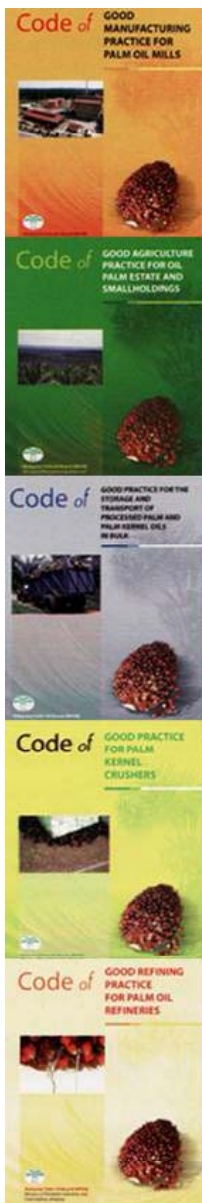
14. PRESS CONSTRUCTION/OPERATION

1	Scope	Food Product Application
2	Objective	Prevent iron contamination by hard facing press screws to reduce wear
3	Principles	Iron in CPO promotes oxidation
4	Criteria	Quality deterioration of CPO
5	Indicators	DOBI value of CPO
6	Verifiers	Audit-internal/external



15. VIBRATING SCREEN/ CRUDE OIL TANK/PUMPS

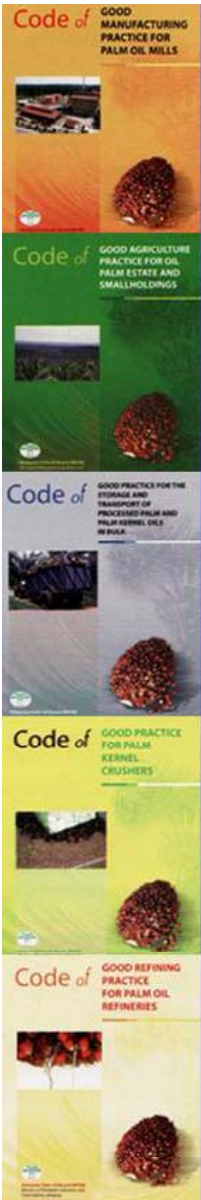
1	Scope	Food Product Application
2	Objective	Ensure good screening of tailing from CPO
3	Principles	Solids in CPO obstructs oil separation from crude
4	Criteria	Improved oil extraction
5	Indicators	Lab analysis for oil loss in waste water
6	Verifiers	Audit-internal/external



16. CRUDE OIL TANK

1	Scope	Food Product Application
2	Objective	Ensure least iron contamination of CPO
3	Principles	To reduce oxidation of CPO
4	Criteria	To maintain CPO quality
5	Indicators	Lab analysis for oil loss in waste water
6	Verifiers	Audit-internal/external

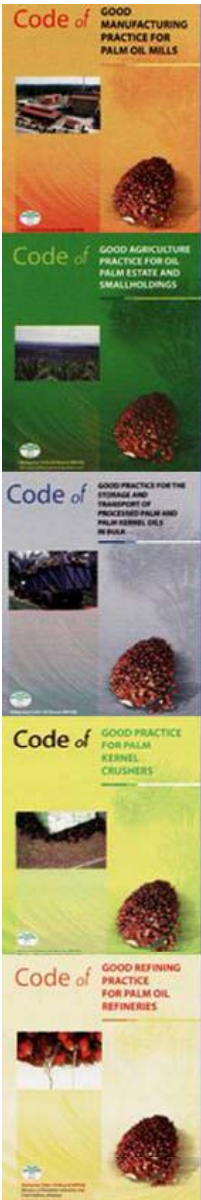




17. CRUDE OIL PUMPS

1	Scope	Food Product Application
2	Objective	To prevent emulsification of CPO by using positive displacement pump
3	Principles	Difficult to separate emulsified oil
4	Criteria	Reduce oil loss in waste water
5	Indicators	Lab analysis for oil loss in waste water
6	Verifiers	Audit-internal/external



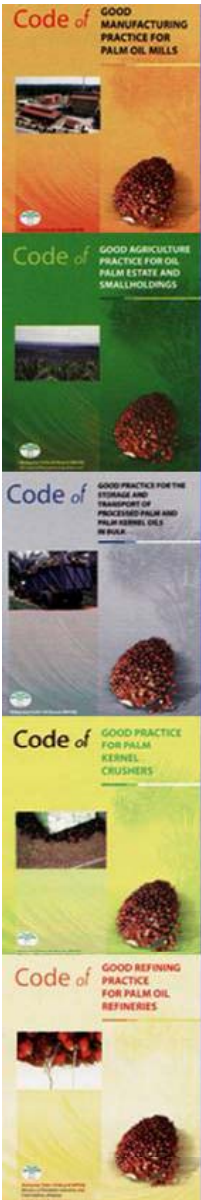


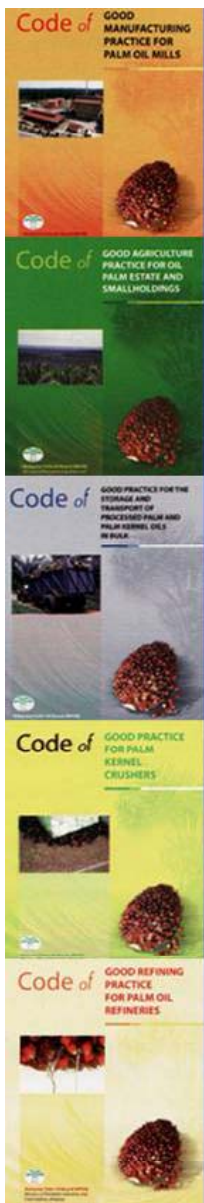
18. CLARIFICATION PROCESS

1	Scope	Food Product Application
2	Objective	Maintain temperature > 90° C
3	Principles	At high temperature least viscosity and best separation
4	Criteria	Better oil extraction
5	Indicators	Lab analysis
6	Verifiers	Audit-internal/external

19. CLARIFICATION TANK

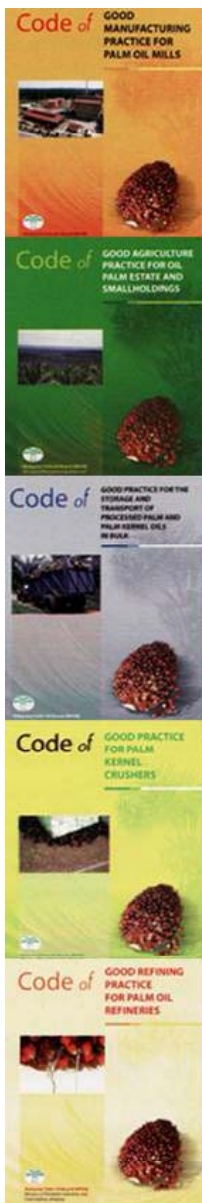
1	Scope	Food Product Application
2	Objective	Use non ferrous material or s/s for lining to reduce iron contamination
3	Principles	To reduce oxidation of CPO
4	Criteria	To maintain quality of CPO
5	Indicators	Lab analysis for iron and DOBI values
6	Verifiers	Audit-internal/external





20.OIL PURIFICATION & DRYING

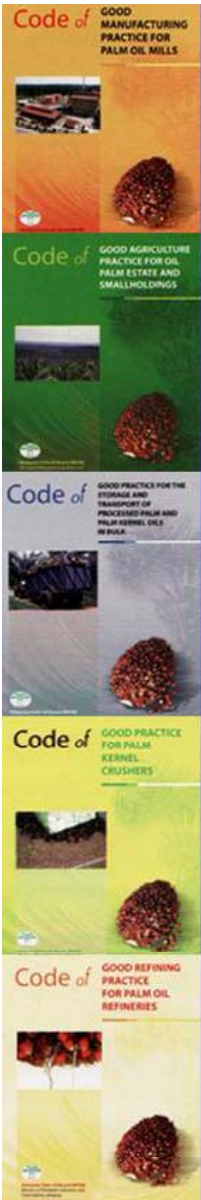
1	Scope	Food Product Application
2	Objective	Ensure > 700 mm vacuum to ensure good drying of CPO
3	Principles	To maintain low moisture & dirt level in production CPO
4	Criteria	Maintain moisture <0.15%, dirt < 0.015 to ensure product quality
5	Indicators	Lab analysis
6	Verifiers	Audit-internal/external



21. CUDE PALM OIL STORAGE

1	Scope	Food Product Application
2	Objective	Maintain temperature below 50°C by automatic temperature control system
3	Principles	To reduce oxidation of CPO
4	Criteria	To maintain quality of CPO
5	Indicators	Lab tests DOBI values
6	Verifiers	Audit-internal/external





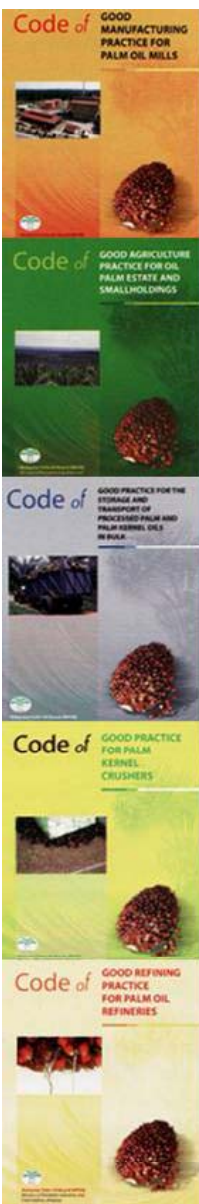
22. CPO STORAGE TANK

1	Scope	Food Product Application
2	Objective	Must be coated, bottom 3 meters with epoxy, s/s, ceramic or linseed oil
3	Principles	Reduce iron pick up by CPO
4	Criteria	Iron causes oxidation of oil
5	Indicators	Lab tests for DOB, iron content
6	Verifiers	Audit-internal/external



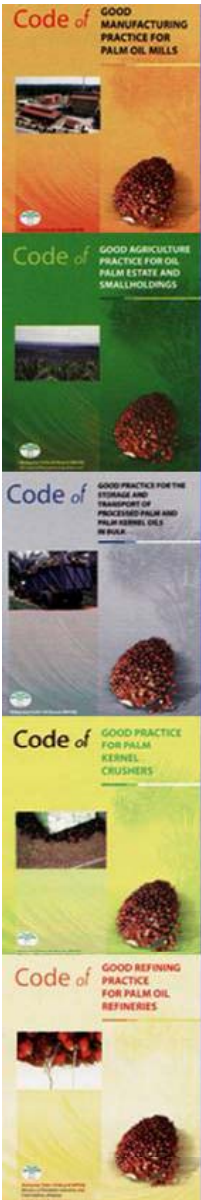
23. CPO TRANSPORTATION

1	Scope	Food Product Application
2	Objective	Tanks must be clean and sterilized with hot water
3	Principles	To prevent entry of microbes into CPO
4	Criteria	CPO must be free from microbes- traceability – marketing tool
5	Indicators	
6	Verifiers	Audit-internal/external



24. SLUDGE HANDLING

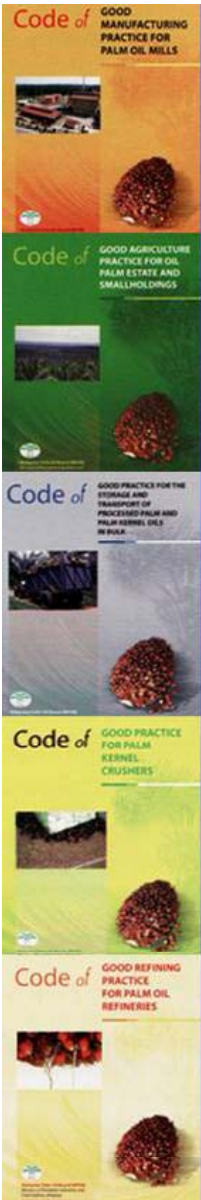
1	Scope	Food Product Application
2	Objective	Oil from sludge must not be recycled into process line
3	Principles	Causes introduction of microbes
4	Criteria	CPO must be free from microbes- traceability – marketing tool
5	Indicators	Test for microbes on a routine basis
6	Verifiers	Audit-internal/external





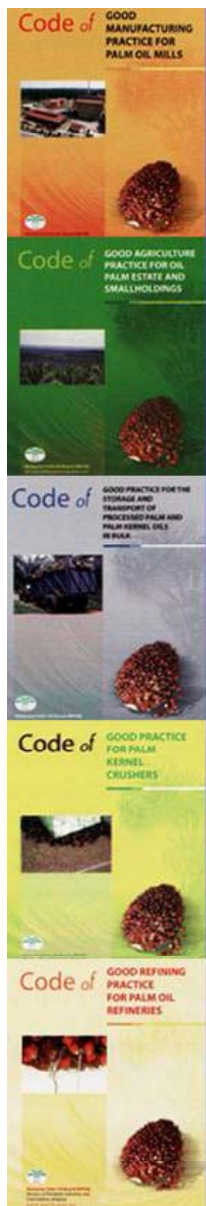
25. KERNEL DRYING PROCESS

1	Scope	Food Product Application
2	Objective	Ensure kernel drying with hot air at 70° C for a minimum of 14 hours
3	Principles	Kernel heating must ensure a moisture level < 7%.
4	Criteria	To prevent the kernel from being moldy
5	Indicators	Analysis of kernel dryness
6	Verifiers	Audit-internal/external



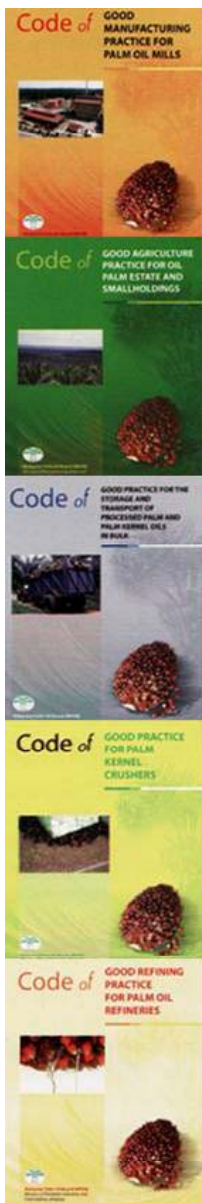
26. KERNEL STORAGE

1	Scope	Food Product Application
2	Objective	Must be stored in silos, bunkers or bags and never dumped on floor
3	Principles	Danger of microbial contamination by dogs, cats, rats, birds etc
4	Criteria	Kernel must be free from microbes-traceability issue loss of market
5	Indicators	Management policy and strict implementation. Regular checks
6	Verifiers	Audit-internal/external



27. NUT CRACKING PROCESS

1	Scope	Food Product Application
2	Objective	Broken kernel must be as low as possible by using good nut crackers
3	Principles	Broken kernel subject to microbial contamination
4	Criteria	Food safety to be maintained to enhance marketability of kernel products
5	Indicators	Regular lab analyses for microbes
6	Verifiers	Audit-internal/external

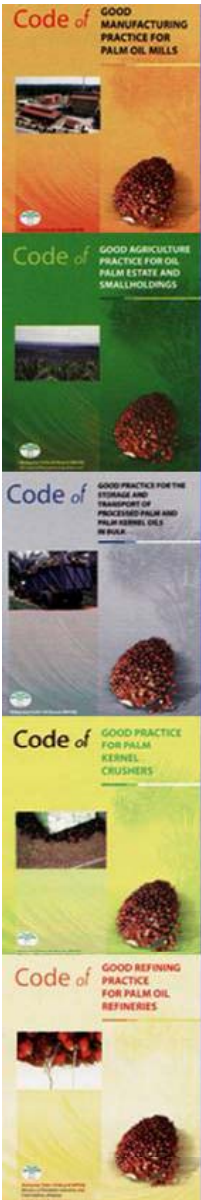


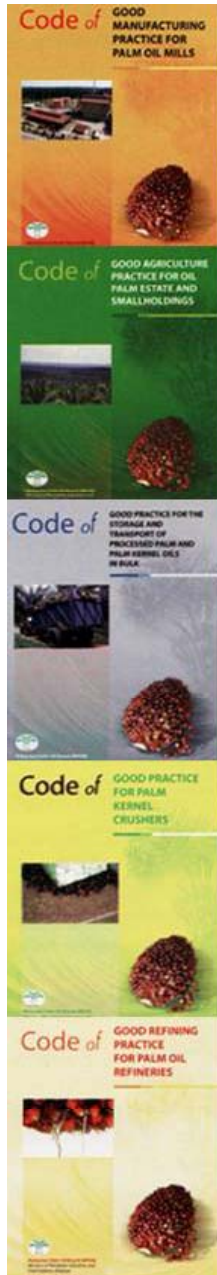
28. ENVIRONMENT

1	Scope	Food Product Application
2	Objective	Boiler smoke emission to conform to DOE limits
3	Principles	Will cause pollution of atmosphere
4	Criteria	Detrimental to health and well-being of people
5	Indicators	Lab results and DOE checks
6	Verifiers	Audit-internal/external

29. PALM OIL MILL EFFLUENT

1	Scope	Food Product Application
2	Objective	BOD of effluent to meet DOE limits all the time
3	Principles	To prevent endangering eco systems and water contamination
4	Criteria	Global requirement to preserve eco system
5	Indicators	Analysis on a routine basis
6	Verifiers	Audit-internal/external





THANK YOU

FOR LISTENING
BUT
PLEASE IMPLEMENT
WHAT YOU JUST HEARD