Table 2.6 Comparison of cocoa bean contract standards (adapted from ITC, 2001).

	Description (example of growth/grade)	Bean count	Cocoa bean faults			Foreign material (%)
			Mould (%)	Slate (%)	Infested (%)	
FCC[a] (Europe)	Good fermented, main crop	100/100 g	5[b]	5	–[b]	<1.5[c]
FDA/CMAA[d] (USA)	Ghana (main crop)	1000/kg	4[f]	10	4[f]	NS[g]

[a] FCC specifies the beans shall be uniform in size, homogenous and fit for the production of foodstuffs. The beans must be virtually free from contamination, which includes smoky, hammy or other off-flavour, taste or smell.

[b] Max 5% defectives (= mouldy + infested).

[c] <1.5% waste passing through 5 mm sieve. Additionally flat beans, bean clusters, broken beans and foreign material must not be excessive.

[d] CMAA specifies that hammy or smoky cocoas are not deliverable.

[f] Maximum amount of mould + infestation is 6% (US FDA defect action levels).

[g] NS = Not specified.

Figure 2.17 Cut test on dried cocoa beans. Reproduced with permission of Remo Nägeli.

Slaty beans are beans in which more than 50% of the cotyledon is grey or slaty in colour. These beans have not undergone fermentation and they have a low level of cocoa flavour with high levels of astringency. The cut test is often used to assess the degree of fermentation by counting the fully brown, brown/purple and purple coloured beans. This is very subjective and is unreliable except when a single assessor is checking beans from a single source. The results do not correlate directly with the quality of the chocolate made from the beans.

Insect-damaged beans are those where the bean has been penetrated by an insect, which feeds on the cotyledon. These should not be present. Any number will involve loss of material and a risk of contamination with fragments of the insects. Germinated beans are those where the seed has started to grow before being killed during the fermentation or drying process and the shell has been pierced by the growth of the first root. In the dry germinated bean, the root usually drops out, leaving a hole, which makes the bean more easily attacked by insects and moulds. Flat beans are those which have begun to form, but have not developed or filled out. There is no useful cotyledon in them so they simply add to the shell content, which is waste.

For the chocolate manufacturer, the yield of nib from a lot of cocoa is economically very important, as is the amount of cocoa butter within the nib. Higher levels of cocoa butter mean that lower amounts will need to be added later on in the manufacturing process. Nib yields are determined in the laboratory, normally by shelling a number of beans by hand. Results are usually expressed on a dry basis (i.e. at 0% moisture). It is important to note that