

ADDITIVITY

The terms in the mathematical model for a design are additive. In an RCB, the treatment and block effects are assumed to be additive.

This means the treatment effects are the same in all blocks and the block effects are the same in all treatments.

Additive			
Block	I	II	
Trt 1	10	(+10)	20
	(+20)		(+20)
Trt 2	30	(+10)	40

In some cases multiplicative effects are found.

Multiplicative			
Block	I	II	
Trt 1	10	(+100%)	20
	(+200%)		(+200%)
Trt 2	30	(+100%)	60

Where effects are multiplicative, a log transformation can be used to transform them into additive effects. Here are the data above after transformation.

Log Transformation			
Block	I	II	
Trt 1	1.00	(+.30)	1.30
	(+.48)		(+.48)
Trt 2	1.48	(+.30)	1.78