

## **Appendixes**

### **Appendix A**

## Fodder Enterprises (FE)

### EXPLORING THINKING BIASES, HEURISTICS AND PERCEPTIONS DURING DECISION MAKING ABOUT STARTING A VENTURE OR NOT

Dear Owner, Manager, Student, Respondent,

Thank you for giving up an hour of your precious time for this research without which success is not possible.

The following questionnaire is part of an extensive research study undertaken to investigate the phenomenon of thinking biases and heuristics during the decision to start a venture. Your personal thinking is crucial. There are no right or wrong answers but it is important to indicate **your personal view and thinking** irrespective of what you may believe others will think.

The aim of the study is to investigate how people use information under complex and ambiguous conditions.

It will be highly appreciated if you would complete it as thoroughly as possible. All information will be treated as confidential and will only be used for academic purposes and reported as mathematical averages, variances and correlations.

Thank you very much,

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.....  
**Instructions for completion:**

- 1. Please answer all questions regarding the case as accurately, objectively and as extensive as possible.*
2. Make a cross (X) in the space provided which reflects your answer/choice most accurately, for each of the questions.
3. Where asked for comments or to specify, please keep these as brief and clear as possible.
4. Don't ponder too long on a question – your first thoughts are important.

Please answer the questions in sequence and do not go back to change previous answers.

**Take one minute to page through the questionnaire to see the style of the questions before you start reading the case.**

**Do not discuss with other respondents – if necessary, ask the supervisor/s if you need something**

**Then read the case study and complete the questionnaire**

## **Fodder Enterprises (FE)**

Researching the development of animal feed from different by-products such as tomato, pineapple, potato and orange peels at the juice factory as well as a brewer's grain from the beer brewery led to many failures. It was always the problem of too much moisture and getting it out of the final product. The end result was mostly one of rotting end product. But let us begin at the beginning.

### **Background**

The story began as follows:

Lauricio Petorni (LP) was an animal scientist with an M Sc degree in Animal nutrition. Working at the Nosuthe University (NU) for almost 20 years, his field of expertise/interest was mainly focused on the development of cheap feedstuffs to feed animals with. He had extensive experience in treatment of maize and wheat residue (left-over after harvesting) to improve digestibility before feeding it to cattle. His peers knew him as a dedicated researcher who could focus narrowly on his research problems.

The competition for grains between humans and animals is also increasing. Especially ruminants (cattle and beef) are under more pressure than for single stomached animals (Chickens and pigs) because of the big difference in feed conversion ratio (FCR) between the species. For example cattle uses 6.5kg maize to gain 1kg of live mass under feedlot conditions. Chicken requires 1.8kg feed for one kg live mass and pigs have a ratio 2.8:1 when intensively fed. It is therefore sensible to feed maize to chickens and pigs rather than cattle especially when maize production costs are constantly rising.

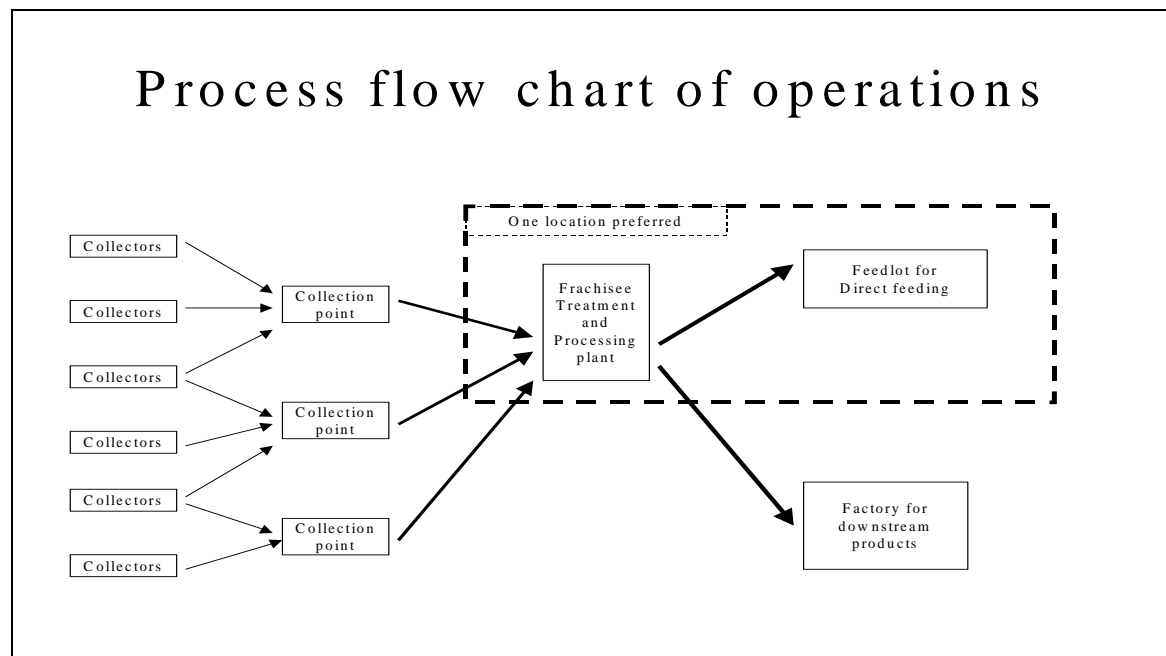
With the sharp fluctuations in price, feedlot owners are further pressurised to find alternative feed sources. It all depends on the rain – normally when it rains the price falls, when it is dry the price increases. Unfortunately, irregular importing of cheap maize for human consumption influenced this generalised relationship of price and rain. All this contributed to the need for finding

alternative sources of animal feed. Living in Southern Africa where there are many droughts on a regular basis, the research LP undertook was highly relevant.

## The idea

Mowing the lawn one hot summer day in 1993 it suddenly struck him. All the gardens, the grass, the problem to get rid of the cut grass etc. etc. Everything fell into place as he realised he was cutting the first samples of his research for the next five years. He immediately started packing some grass samples into plastic bags to take to work on Monday. Why has nobody thought about it – it was so obvious and the resource (cut grass) seemed to be unlimited? How many gardens and parks with grass to be cut are there in all the cities and towns? The potential is unthinkable.

In 1997 he received the first prize for best innovation at the annual Science Commission Innovation Fair (SCIF) totalling R40 000.



## The initial problems

In the beginning there were many obstacles such as too much moisture, rotting (high butyric levels resulting in compost rather than fodder) during

storage, unstable preservation, variable nutritional levels after treatment, time delays during gathering the raw material, storage limitations and several more.

Over several years he worked out a preservation formula that created a fairly stable product. With a strictly followed process he established a system that eliminated the problems one by one. He can now take the cut grass, treat it, preserve it and then feed it to cattle or sheep.

## **The proposed system**

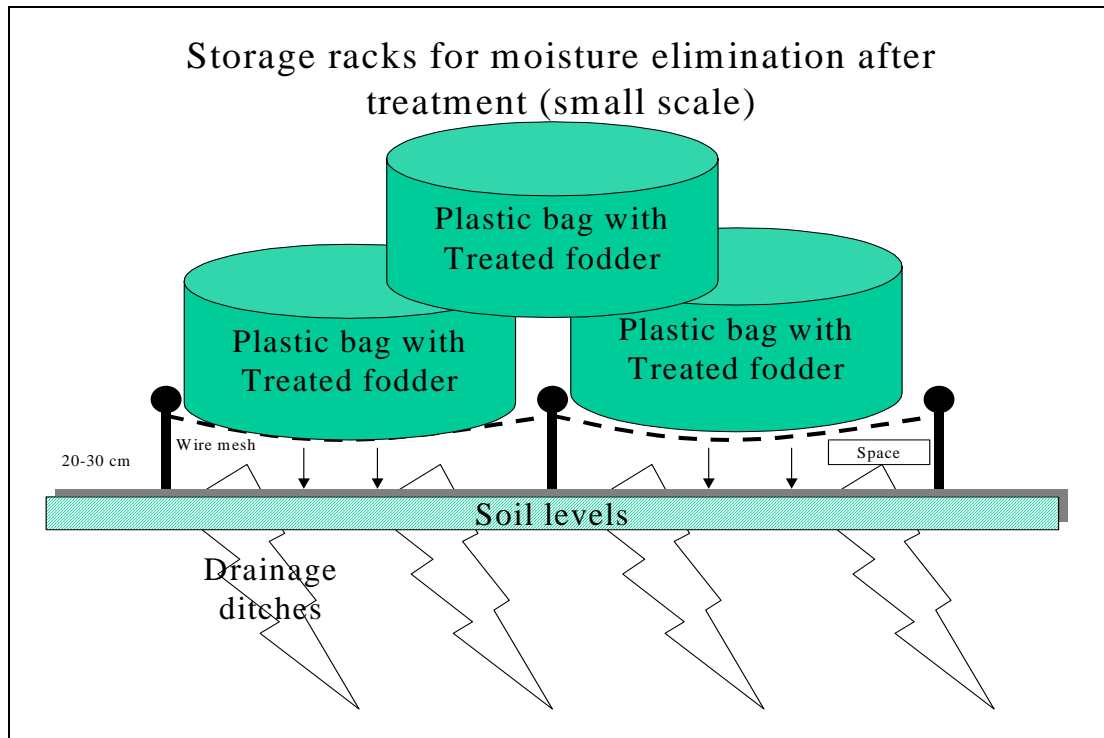
The final system followed the basic process and steps of:

- Take the cut grass (after mowing the lawn) in plastic bags to a central collection location
- Do the first quality control at this point by removing foreign objects and determining price based on quality of the grass
- Move grass to the treatment area
- Ensure the correct moisture levels (can add water afterwards if necessary)
- Add the secret formula and mix properly
- Placing it in larger plastic bags and close the bags properly or
- Place grass on filter racks and inject the correct amount of ammonia gas
- Ensure moisture drainage over the following 2 to 4 weeks
- Store for two to four weeks depending on the ambient temperature
- Remove the pre-dried fodder (final product) for final quality check and
- Then dry the fodder before starting the feeding process or
- Send the final fodder to the production plant, if it is not fed to animals in the feedlot

There are two basic systems or a combination for franchisees:

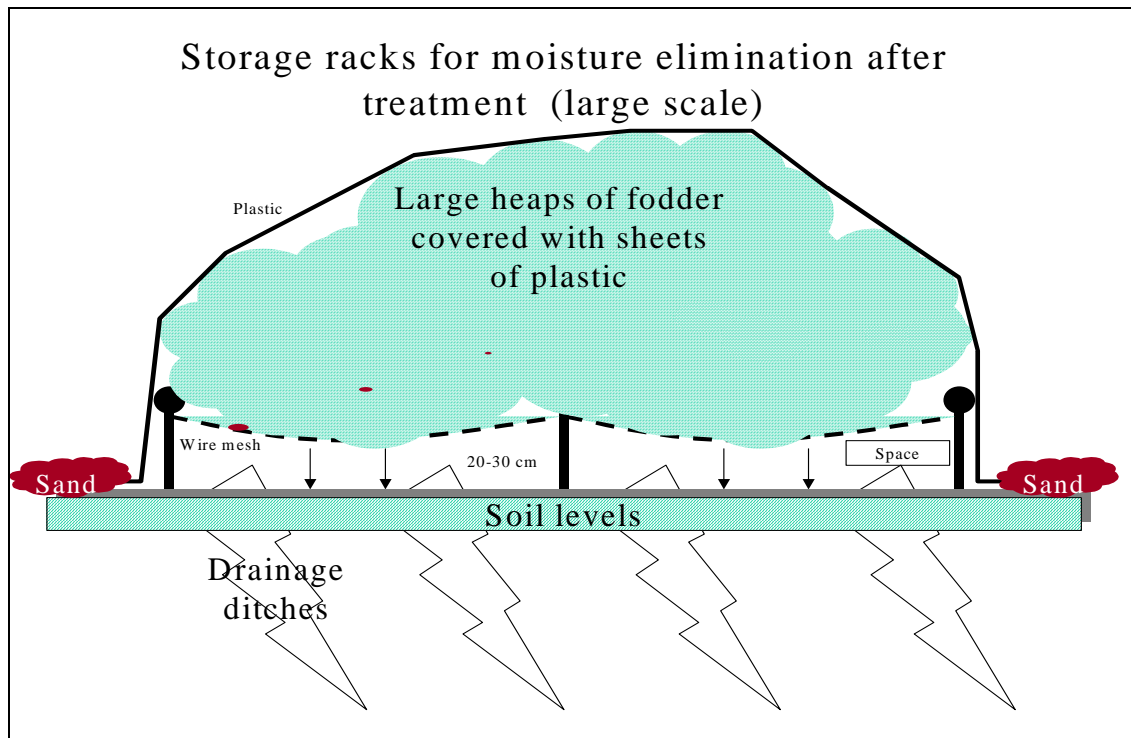
- Small quantities in hay bags (allows for a gradual start-up) or

- Large quantities covered under plastic sheets that allows for some measure of scale economies
- It is however possible to use them in combination and this allows for relative flexibility.



There are several finer details that are not reported in the case because it is seen as the competitive advantage of the process. It is mostly based on detail knowledge about the formula, the application process and certain key sensitivities that can make the process fail completely. He ensured that he knows these finer points as it all contributes to the protection of the competitive advantage.

After seven years the formula is now finally registered for use under the Law for animal feeds of 1957 regulations. This process is supported by many hours of hard work and several applications, tests and research results done by the Agricultural department research station at Irene.



## The opportunity

### 1.1 The market and projected demand

Availability of the raw material is unlimited and while he made so many calculations to determine how much grass is available, it is mind boggling to quantify. All he knows that it is a lot.

There are several market segments that he believes to consider for the raw fodder (pre-dried) product namely:

- The existing commercial farmers using the fodder for their cattle
- Future potential farmers
- The small scale rural farmers (Imagine the positive effect that the system can have on the preservation of the severely overgrazed environment)
- Existing feedlot operators
- Small holding owners looking for opportunities
- Agricultural Cooperatives producing and selling feeds to their clients



The production of the final fodder product has an additional and different target market namely:

- Any entrepreneurs interested in developing the business system as potential franchisees (they will always buy the formula from him like the Coca-cola principle) – ideally these can also be farmers who want to produce both feed and meat.
- Existing garden service operators who are already doing most of the business anyway as part of their business
- Small operators selling the grass to franchisees – Imagine every unemployed person can now have access to a job by either cutting lawns and selling the “grass residue” or by collecting offal and delivering it to the collection point on a daily basis for a fee and thereby have their own small businesses.
- Municipalities that experience problems with large garden refuse problems
- Owners of sports grounds that have a problem with grass residue – think how many schools can earn additional income to even out their negative balances.

The size of the market is significant – Talking to John Rawlins, Chairman of the feedlot association for the past seven years and life long very close and trusted friend of his father, he believes there is not enough grass to replace the use of maize completely but using the fodder will reduce costs significantly. “It would make the South African beef industry a lot more competitive in the world” was his final comment. Lauricio was practically brought up by John Rawlins.

## **1.2 The economic model**

Compared to maize at an average price of R1119/ton during 2003, the price of fodder worked out at R310/ton, which is between 25 to 30% of the cost of maize. Its nutritional value however is about 53 - 58% that of maize when feeding young slaughter cattle.

Table 1 Nutritional value and relevant information comparison

	<b>Maize</b>	<b>Fodder</b>
Metabolizable energy (MJ/kg)	11.9	6.7 – 7.3
Crude Protein (% of Dry Matter)	8.3	7.5
Feed cost / kg live mass gain (R/kg LM)*	R7.90	5.10
Expected average daily live mass gain expected (g/day)	750 – 850g/day	420 – 470g/day
Days to feed to reach target mass	120 – 130 days	200 – 220 days

\*It is known that feed cost makes up 75% of total costs in a feedlot and non-feed costs (NFC) the rest.

Fixed cost to establish a processing plant amounted to R250 000 for a franchisee. He would need a site of minimum 1 ha, which made it very desirable for small holding owners. Repayments are indicated in the financial projections.

Breakeven volume for a plant seems to be approximately 350 000 tons per month for nine months per year (See Table 2).

His own calculations based on many hours behind his computer suggest that he must find at least 17 good franchisees suggests that he could make over R3 000 000 per year from year four onwards (for at least 10 years). Looking at the growth of franchising in South Africa the number seems to be no problem.

The first three years will burn cash at a rate of over R2 000 000 per year thus giving a positive cash flow after three years and cash breakeven after year five. Of course, finding more good franchisees will improve the situation significantly.

However, not finding the correct franchisees could lead to a failure of the project and he will end up with nothing left of his life savings as well as R900 000 in debt. The investors would also hate him, as they will have lost a

between R500 000 to a million each. Not being successful will also bring serious harm to his family, as he will have to use all the provisions in the form of insurance, savings, inheritance and home loans made for their future, as investment in the project.

### **1.3 Financing**

The feed production plant is estimated to cost R3 500 000 (quoted by an engineering firm) including the land that he has already secured in the Bronkhorstspuit area. Lauricio thinks that if they erect the plant themselves, they would be able to save approximately R 1 100 000.

At this plant the final product combinations will be done and the fodder be turned into cattle blocks, pellets and different combinations of feed for the different species and age groups. Products such as dairy pellets, calf grower meals, lamb crumbs etc. etc. will also be produced.

This plant will provide approximately 80 jobs all year round once it is in full operation excluding all the other jobs created for unemployed entrepreneurs who can set up their own income streams.

The banks are not exactly negative about the plan because they are not chasing the deal as Lauricio hoped they would have. Especially the bank manager did not appear overly friendly towards him and was so focussed on the financial ratios. The bank seems willing to extend a 50:50 loan based on equity provided. It seems that they actually require more security than the value of the project instead of the loan only. The final decision of the bank is awaited at the moment.

This feed production plant is an extension of the first process through value addition to the fodder being used in the feedlots or on the farms. It is done to ensure stability to the product and to extend its shelf life. The fodder, after opening of the bags, does not have a long life and once the bags are opened the feed must be consumed within seven days (in the bags, the fodder can be stored for years). This however poses no problems under feedlot conditions or

on farms where smaller groups of animals are fed because they are fed daily anyway.

#### **1.4 Competitive Environment and Advantage**

The formula is a definite advantage that appears difficult to copy, if at all. If a franchisee leaves after learning the system, he will still have to obtain the formula from LP in future if he wants to start/proceed with his own operation.

There are researchers working on the same concept but no one has knowledge of the formula. Once the different cooperatives latch on, like the one that made the offer, they would probably be able to copy the concept. This is no concern to LP because he believes that five years will give him enough time to establish him as market leader anyway.

#### **1.5 The Resources**

##### **Equipment and facilities for franchisees**

Needed for a feed production plant is a small holding of approximately one hectare and preferably close to the origin of “production”. Collection points can be used as intermediate steps to enable the unemployed access without major transport problems. The further from the source’s origin, the cheaper the resource but the more the cost of transport, the ever-relevant trade-off.

A plant requires an ammonia applicator that retails for approximately R21 000 and at least one LDV and preferably one 3 ton Dyna of approximately R 187 000.

Other structures required include wooden poles with wire mesh to allow for drainage of the excess moisture. Some smaller farming tools such as hayforks, shovels etc are also required (See also the associated diagrams).

Careful use of the plastic bags or large plastic sheets allow for re-use and can assist in driving down the costs.

An electric dryer of approximately R65 000 can be installed under a roof to expedite the drying process but it is optional. The sunshine that typical of the African summer is sufficient to use especially with so many unemployed people around. Actually drying is not necessary when the fodder is directly fed to the animals.

### **Capital and Management**

Lauricio has already convinced nine other people (all members of his matric class in 1975 and the most were his buddies in the army later) to become investors and each has contributed R500 000 (R250 000 in cash for which some extended their home loans and the rest in promise to be paid on final bank approval) so he is having R5 000 000 (half on promise) to get the show on the road. LP is the entrepreneurial brain and having accumulated lots of untaken leave he is planning to use sabbatical leave of one year to get the project of the ground and managing everything (he has to go back for the same period after the sabbatical leave or else have to repay the institution for one year's salary).

He has structured the deal with the investors in such a way that none of the key elements such as the formula and the licences make up part of the deal while only the feed factory is part of their deal. He kept it (the formula as competitive advantage) out in a separate business. Franchisees will always obtain their formula from LP directly as this is how he plans to protect his trade secret.

Interestingly that he recently had an offer from an agricultural Cooperation for R7 500 000 to sell his idea, the formula, the licences and research results. This leaves him with R2 500 000 (excluding his own R500 000 that he has not paid in yet) and each investor with 50% return on investment (ROI) after the first year. They (the Cooperative) have also offered him a position and good salary guaranteed for three years to run their research laboratory associated with project for them. He has contemplated the offer big time but felt that he has invested several years of research and his life into this project and could not see his way open to sell his life work for money only. There is more to life

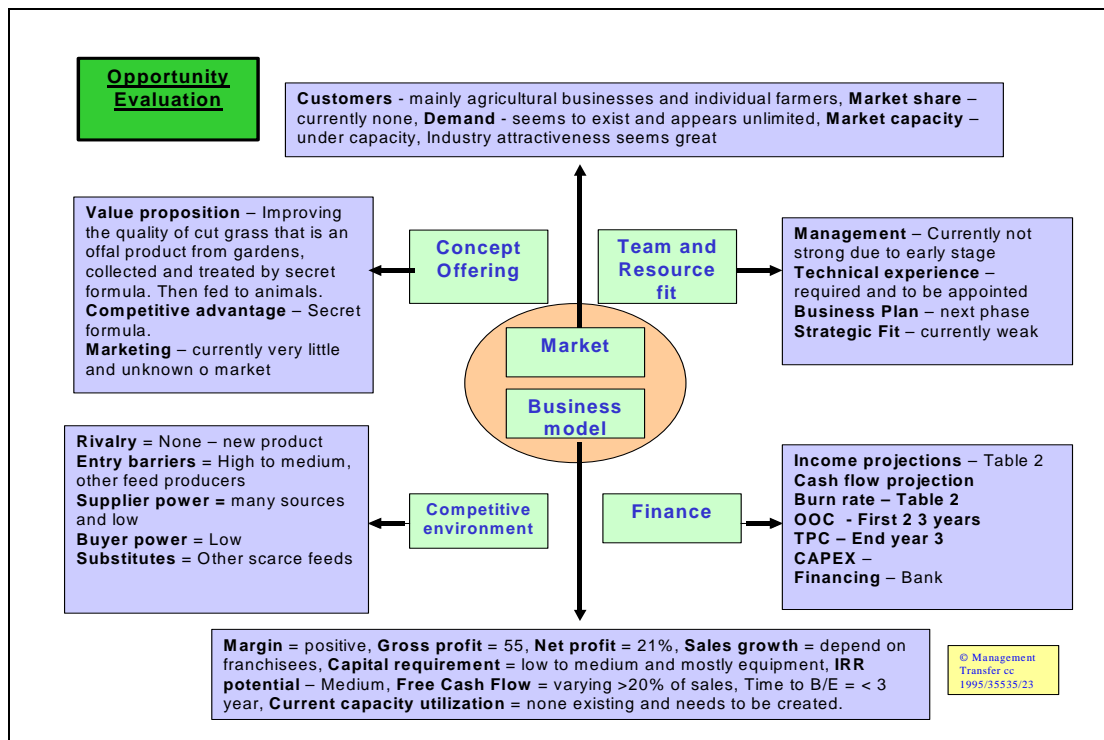
than money and this is his “baby”. Also, he would like to turn the ridicule of co-researchers in years gone by around by proving himself. He wanted the achievement to be his and nobody else’s. The acknowledgement is very important to him.

The management requirements for franchisees are not too high and a few retired people with their own transport can easily be trained to run the respective operations. He developed an opportunity analysis after reading up some books on small business start-ups (see diagram).

## **1.6 The advantages of the project**

There were some excellent advantages to be gained from this business namely:

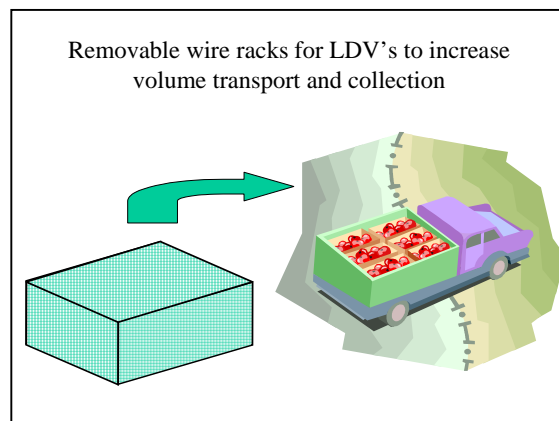
- The effect of less garden refuse that is costly to dispose can be solved
- Unemployed people can find jobs easily by starting their own businesses (Estimations indicate that an individual could make approximately R50 to R80 per day for selling the cut grass at R0.20 to R0.50 /kg)
- Think about it as a double income business – people pay you to remove their cut grass (offal) and you can sell it before or after value addition
- With the newly imposed ban on the use of animal by-products as components of animal feeds there is a dire need for more natural raw material with high protein values that can be used
- The problem with acidosis (acidic stomachs due to high levels of maize grain) is reduced by 95% and animals is much more healthy
- The raw material is already cut to the exact size for optimal digestibility
- The latest tests indicate that the fodder is also a cheap alternative for feeding of game during the regular dry spells experienced in Southern Africa. Ongoing research is currently establishing what supplements will give best results.



## 1.7 The Disadvantages of the project

Like all products there are some disadvantages that need to be overcome namely:

- The product is bulky which makes it expensive per weight to transport (volume per weight relationship) – special transport racks have been designed to fit onto LDV's to increase trip weights – see picture



- Erratic cash flow is expected for the first three years and where-after things will smooth out if the systems are installed properly
- If quality is not well controlled and tested, the fodder turns into compost, which cannot be fed to animals (they do not eat it due to low palatability). Therefore quality control is executed at the first point of collection and is a crucial component of the whole process.

- Incorrect application of the formula and ammonia can lead to aflatoxin production (mould formation), which is poisonous to animals – quality assurance is therefore crucial to avoid potential claims for deaths in feedlots. This demands hands-on management by franchisees especially before and during treatment.
- Being dependant on the availability of grass there is a lull during the winter months of May, June, July, and August (which allow a quiet period of distribution especially during dry spells as well as maintenance of equipment etc.)
- The key need is that of storage of the fodder for which a large space is required. The space required does not need to be covered, so open space is fine.

### **1.8 The challenge**

Lauricio is now faced with the final decision of going ahead when the bank gives their approval. Or not?



**Appendix B**

**EXPLORING THINKING BIASES, HEURISTICS AND PERCEPTIONS DURING DECISION MAKING ABOUT STARTING A VENTURE OR NOT**

Section A: Biographical information

Full names and Surname: \_\_\_\_\_ Student Number: \_\_\_\_\_

Contact number : \_\_\_\_\_ (needed in case clarification may be needed)

Mark your highest qualification with an "X"

	Qualification		Currently busy with
1.1	B Com Entrepreneurship 2 <sup>nd</sup> year		
1.2	B Com Entrepreneurship 3 <sup>rd</sup> year		
1.3	B Com Other _____ (please indicate)	Year _____	
1.4	BA _____ (please indicate)	Year _____	
1.5	M Phil Entrepreneurship student		
1.6	PhD Entrepreneurship student		
1.7	MBA student		
1.8	Any other _____		
1.9	Recently in own business (< 5 yrs)		
1.10	In own business for more than 5yrs		
1.11	None at all		
1.12	Odd grouping		

V4-5				2
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Indicate your agreement with the following statements

		Strongly disagree	Disagree	Slightly disagree	Unsure	Slightly agree	Agree	Strongly agree			
1.13	I have previous business experience	1	2	3	4	5	6	7	V6		3
1.14	I definitely want to start my own business in future (If in business already, mark 7 please)	1	2	3	4	5	6	7	V7		4
1.15	People think of me as innovative	1	2	3	4	5	6	7	V8		5
1.16	I have knowledge of the animal feed industry	1	2	3	4	5	6	7	V9		6

My current occupation is: \_\_\_\_\_

V10-11			7
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My home language (mother tongue) is \_\_\_\_\_

My gender is Male / Female

V12-13			8
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V14			9
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My age at my last birthday was \_\_\_\_\_ years.

V 15-16			10
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Section B: Venture start-up decision and risk orientation

It is important that you answer the questions in sequence. Never skip a question or go back to add something to anything previously written than to the question you are working on.

While reading the case my very first thought about whether the concept is viable or not was ....

	<b>Definitely not viable</b>						<b>Definitely viable</b>	
1.17	1	2	3	4	5	6	7	V 17

1.18	Please indicate what made you think that at that first moment?								
								A	
								B	
								C	
								D	

V	18	19	20	21
Item	12	13	14	15

1.19	The approximate line when the thought struck me was line number .... (Line numbers on left hand)		V 22 - 24				16
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Write down all the things (not necessarily about the case specifics) that you thought about when reading the case. Please spend at least 3 minutes on this question

V	25	26	27	28
Item	17	18	19	20

Now, put yourself in the shoes of Lauricio Petorni and Fodder Enterprises (FE) and answer the following questions based on the available case information by marking the appropriate level of agreement with the statements. Mark on the scale of 1 to 7. Do not mark 4 for these two questions.

		Definitely not start			Unsure	Definitely Start			V		
1.20	Should Fodder Enterprises proceed with introducing the concept to the market?	1	2	3	4	5	6	7	29		21

		Definitely sell concept			Unsure	Definitely start self			v		
1.21	Assume that all the principals (stake holders) of FE had the choice of taking the offer of selling the concept and make the modest profit, What should FE do?	1	2	3	4	5	6	7	30		22

I believe that ....

		Strongly disagree							Strongly agree		V	item	
1.22	The probability of FE doing poorly is very high	1	2	3	4	5	6	7		31		23	
1.23	The amount FE could lose by introducing the concept is substantial	1	2	3	4	5	6	7		32		24	
1.24	There is great uncertainty when predicting how well FE will do with the concept introduction	1	2	3	4	5	6	7		33		25	
1.25	The overall riskiness of FE's concept is high	1	2	3	4	5	6	7		34		26	
1.26	Overall I would label the option of introducing the concept as a business venture as something negative	1	2	3	4	5	6	7		35		27	
1.27	I would label introducing the concept as a potential loss	1	2	3	4	5	6	7		36		28	
1.28	Introducing the concept will have negative ramifications for FE's future	1	2	3	4	5	6	7		37		29	
1.29	There is a high probability of FE losing a great deal by introducing the concept	1	2	3	4	5	6	7		38		30	

The three most important pieces of information in the case that influenced my decision to start the venture or not (in order of importance) were ....

	Piece if of information used for my decision	Reason why this influenced my decision			
1 <sup>st</sup>				A	
				B	
				C	
				D	
2 <sup>nd</sup>				A	
				B	
				C	
				D	
3 <sup>rd</sup>				A	
				B	
				C	
				D	

V	39	40	41	42	43	44	45	46
Item	31	32	33	34	35	36	37	38

The three most important pieces of information not given by the case and that I needed for a better decision to start the venture or not (in order of importance) are ...

	Piece if of information needed for my decision	Reason why this is needed for a better decision			
1 <sup>st</sup>				A	
				B	
				C	
				D	
2 <sup>nd</sup>				A	
				B	
				C	
				D	
3 <sup>rd</sup>				A	
				B	
				C	
				D	

V	47	48	49	50	51	52	53	54
Item	39	40	41	42	43	44	45	46

The following influenced my decision to start the venture or not – Rate each individually.

	Statement	Strongly disagree	Disagree	Slightly disagree	Unsure	Slightly agree	Agree	Strongly agree	V	item
1.30	The exact monthly breakeven volume = 350 000 tons (+-line 130)	1	2	3	4	5	6	7	55	47
1.31	The cost saving that could be achieved (shown in Table 1)	1	2	3	4	5	6	7	56	48
1.32	His persistence to overcome all the problems he faced through the years	1	2	3	4	5	6	7	57	49
1.33	The business appeared to have unlimited alternatives to grow	1	2	3	4	5	6	7	58	50
1.34	The financial calculations supplied in Table 2	1	2	3	4	5	6	7	59	51
1.35	The control Lauricio kept over his formula (i.e the competitive advantage)	1	2	3	4	5	6	7	60	52
1.36	His desire and passion to achieve at the highest level and not sell the concept is commendable	1	2	3	4	5	6	7	61	53
1.37	The way all the parts were put together to make up the concept	1	2	3	4	5	6	7	62	54
1.38	The 50% of capital that was required / needed from the bank	1	2	3	4	5	6	7	63	55
1.39	The job security that he could get from the Cooperative if he sells the concept to them	1	2	3	4	5	6	7	64	56
1.40	The number of unemployed people who's lives could be changed if the project is successful	1	2	3	4	5	6	7	65	57
1.41	The perceived value of the concept as shown by the price he was offered by the cooperative	1	2	3	4	5	6	7	66	58
1.42	The 50% return on investment they could make if they sold immediately	1	2	3	4	5	6	7	67	59
1.43	The apparent security brought by the registration under the animal feed law of 1957	1	2	3	4	5	6	7	68	60
1.44	The potential that there will be serious harm brought to his	1	2	3	4	5	6	7	69	61

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	family if the project fails									
1.45	The uniqueness of the idea	1	2	3	4	5	6	7	70	62
1.46	The value of the offer by the cooperative guided my thinking	1	2	3	4	5	6	7	71	63
1.47	The step-by-step account of the process to be followed to produce the fodder	1	2	3	4	5	6	7	72	64
1.48	Because Bill Rawlins was a trusted friend of his father, his opinion is highly valued	1	2	3	4	5	6	7	73	65
1.49	The potential spin-offs (like environmental benefits) that could come from this project	1	2	3	4	5	6	7	74	66

The following played a role in my decision to start the venture or not.

	Statement	Strongly disagree	Disagree	Slightly disagree	Unsure	Slightly agree	Agree	Strongly agree	V		item
1.50	I could think of a similar case to use as a comparison to help me in the decision	1	2	3	4	5	6	7	75		67
1.51	I have some rules of thumb (guidelines) of my own that I use to make a choice like this	1	2	3	4	5	6	7	76		68
1.52	I always trust my gut-feel blindly for decisions like this	1	2	3	4	5	6	7	77		69
1.53	I was in a very good mood when completing the questionnaire	1	2	3	4	5	6	7	78		70
1.54	I have someone that I would consult before a decision like this	1	2	3	4	5	6	7	79		71
1.55	I felt very pressurised to make the decision of starting or not	1	2	3	4	5	6	7	80		72
1.56	I am sure that my decision is correct	1	2	3	4	5	6	7	81		73
1.57	I work easily (without stress) in an uncertain environment	1	2	3	4	5	6	7	82		74
1.58	The case gave sufficient information for me to make a decision	1	2	3	4	5	6	7	83		75
1.59	The case was easily understood	1	2	3	4	5	6	7	84		76
1.60	I had no language problems reading the case	1	2	3	4	5	6	7	85		77

Putting myself in Lauricio's shoes I think

	Statement	Strongly disagree	Disagree	Slightly disagree	Unsure	Slightly agree	Agree	Strongly agree	V		Item
1.61	I can forecast the total demand for the product better	1	2	3	4	5	6	7	86		78
1.62	I can forecast when the larger competitors will enter the market	1	2	3	4	5	6	7	87		79
1.63	I can make the business a success, even though other may fail	1	2	3	4	5	6	7	88		80



## Section D: Conceptions about the opportunity, environment framing

Despite the information presented in the case, for each of the statements **I think that ...**

	Statement	Strongly disagree	Dis-agree	Slightly disagree	Unsur e	Slightly agree	Agree	Strongly agree	V	item
1.64	There will <u>not</u> be competition that will enter the market within 3 years	1	2	3	4	5	6	7	89	81
1.65	The demand for the product is far more than what can be produced by FE	1	2	3	4	5	6	7	90	82
1.66	The planning makes sufficient provision for the logistics (inbound and outbound) of this project	1	2	3	4	5	6	7	91	83
1.67	Projected long term profitability seems good for FE	1	2	3	4	5	6	7	92	84
1.68	The cash flow will mostly be good	1	2	3	4	5	6	7	93	85
1.69	FE management will be able to handle the challenges they will face	1	2	3	4	5	6	7	94	86
1.70	FE is well protected from future competition	1	2	3	4	5	6	7	95	87
1.71	FE will be able to sell all the production easily	1	2	3	4	5	6	7	96	88
1.72	FE underestimated the assets and equipment needed to make the project work	1	2	3	4	5	6	7	97	89
1.73	Long term profitability is better than short term profitability	1	2	3	4	5	6	7	98	90
1.74	Cash inflows will be regular	1	2	3	4	5	6	7	99	91
1.75	Lauricio has the skills to make the venture work	1	2	3	4	5	6	7	100	92
1.76	FE is able to limit the entry of new competitors	1	2	3	4	5	6	7	101	93
1.77	It will be easy to convince users to buy this unique product	1	2	3	4	5	6	7	102	94
1.78	FE will quickly have enough infra structure set up to reach breakeven point and achieve economy of scale	1	2	3	4	5	6	7	103	95
1.79	Profitability will improve over time	1	2	3	4	5	6	7	104	96
1.80	Cash flow amounts will be adequate for the first three years	1	2	3	4	5	6	7	105	97
1.81	FE has the right people to deliver on this project and succeed	1	2	3	4	5	6	7	106	98

Looking at the FE scenario, **I think that .....**

	Statement	Strongly disagree	Dis-agree	Slightly disagree	Unsur e	Slightly agree	Agree	Strongly agree	V	item
1.82	There are more external opportunities than threats	1	2	3	4	5	6	7	107	99
1.83	The plan shows more strengths than weaknesses	1	2	3	4	5	6	7	108	100
1.84	There is a better chance for success than for failure	1	2	3	4	5	6	7	109	101
1.85	The environment seems ideal for this project now	1	2	3	4	5	6	7	110	102
1.86	FE has more going for it than against it	1	2	3	4	5	6	7	111	103
1.87	Performance potential of FE will increase over time	1	2	3	4	5	6	7	112	104

**Self Efficacy**

Please indicate the extent to which you agree with each of the following statements

	Statement	Strongly disagree	Dis-agree	Slightly disagree	Unsure	Slightly agree	Agree	Strongly agree	V	item
1.88	I am strong enough to overcome life's struggles	1	2	3	4	5	6	7	113	106
1.89	At root, I am a weak person	1	2	3	4	5	6	7	<b>114</b>	<b>107</b>
1.90	I can handle the situations that life brings	1	2	3	4	5	6	7	115	108
1.91	I am usually an unsuccessful person	1	2	3	4	5	6	7	<b>116</b>	<b>109</b>
1.92	I often feel there is nothing I can do well	1	2	3	4	5	6	7	<b>117</b>	<b>110</b>
1.93	I feel competent to deal effectively with the real world	1	2	3	4	5	6	7	118	111
1.94	I often think I am a failure	1	2	3	4	5	6	7	<b>119</b>	<b>112</b>
1.95	I usually feel I can handle the typical problems that come up in life	1	2	3	4	5	6	7	120	113

**HBDI Profile information**

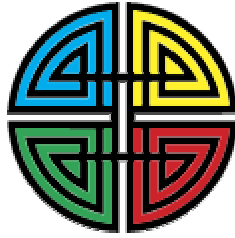
Please make sure your name (and student number if relevant) is included to enable us to obtain the HBDI profile information if you do not know it.

I have completed the HBDI profile assessment Yes / No

Name and Surname \_\_\_\_\_ Student no \_\_\_\_\_

	Score	V	item
1.96	Profile score for A	121 – 123	114
1.97	Profile score for B	124-126	115
1.98	Profile score for C	127-129	116
1.99	Profile score for D	130-132	117
1.100	Adjective pair score for A	133-134	118
1.101	Adjective pair score for B	135-136	119
1.102	Adjective pair score for C	137-138	120
1.103	Adjective pair score for D	139-140	120

## Appendix C



# HBDI

## Herrmann Brain Dominance Instrument Thinking Styles Assessment

This 120-question survey form results in a profile of your preferred thinking styles. By understanding your thinking style preferences you can achieve greater appreciation how you learn, make decisions, solve problems, and communicate, and why you do these things—and others—the way you do. The survey measures preferences rather than skills. It is not a test; there are no wrong answers. You will gain the greatest understanding by answering the questions frankly and sincerely

### Herrmann International

Fax completed form to Marius Pretorius : (012) 362 5198

International telephone number : +27 12 807 5769

E-mail: [mpretorius@postino.up.ac.za](mailto:mpretorius@postino.up.ac.za)

Use of this form is subject to your agreement with the following conditions: (i) The instrument must be used in its entirety; no portion may be extracted and used separately. (ii) No change or alteration of the instrument in any way is permitted; to preserve the integrity of the instrument and its scoring methodology, the instrument must be used exactly as it is produced here. (iii) Any use of the instrument must contain the notice of copyright held by The Ned Herrmann Group. (iv) The title - Herrmann Brain Dominance Instrument - is an integral part of the instrument, and must always appear on the document.

### INSTRUCTIONS

A profile of your mental preferences will be determined by your responses to the following 120 questions. Answer each question by writing in the appropriate words or numbers, or marking the boxes provided. This is not a test, and there are no right or wrong answers. You are only indicating your preferences. Please respond to questions as authentically as possible, keeping in mind your **total self, at work and at home**. When you have completed the survey form, confirm that you have answered every question. Then complete the name and address information on the back of the form, and send or fax pages 2 to 5 to Herrmann International Africa at the address on the cover.

Refer to the glossary of terms for clarification of the terms used. Save the glossary page for reference when you receive your profile results.

## GLOSSARY OF TERMS

**analytic** • Breaking up things or ideas into parts and examining them to see how they fit together.

**artistic** • Taking enjoyment from or skillful in painting, drawing, music, or sculpture. Able to coordinate color, design, and texture for pleasing effects.

**conceptual** • Able to conceive thoughts and ideas; to generalize abstract ideas from specific instances.

**controlled** • Restrained, holding back, in charge of one's emotions.

**conservative** • Tending towards maintaining traditional and proven views, conditions, and institutions.

**creative** • Having unusual ideas and innovative thoughts. Able to put things together in new and imaginative ways.

**critical** • Exercising or involving careful judgement or evaluation, e.g., judging the feasibility of an idea or product.

**detailed** • Paying attention to the small items or parts of an idea or project.

**dominant** • Ruling or controlling; having strong impact on others.

**emotional** • Having feelings that are easily stirred; displaying those feelings.

**empathetic** • Able to understand how another person feels, and able to communicate that feeling.

**extrovert** • More interested in people and things outside of self than internal thoughts and feelings. Quickly and easily exposes thoughts, reactions, feelings, etc. to others.

**financial** • Competent in monitoring and handling of quantitative issues related to costs, budgets, and investments.

**holistic** • Able to perceive and understand the "big picture" without dwelling on individual elements of an idea, concepts, or situation. Can see the forest as contrasted with the trees.

**imaginative** • Able to form mental images of things not immediately available to the senses or never wholly perceived in reality; able to confront and deal with a problem in a new way.

**implementation** • Able to carry out an activity and ensure fulfillment by concrete measures and results.

**innovating** • Able to introduce new or novel ideas, methods, or devices.

**integration** • The ability to combine pieces, parts and elements of ideas, concepts and situations into a unified whole.

**intellectual** • Having superior reasoning powers; able to acquire and retain knowledge.

**interpersonal** • Easily able to develop and maintain meaningful and pleasant relationships with many different kinds of people.

**introvert** • Directed more towards inward reflection and understanding than towards people and things outside of self. Slow to expose reactions, feelings, and thoughts to others.

**intuitive** • Knowing something without thinking it out – having instant understanding without need for facts or proof.

**logical** • Able to reason deductively from what has gone before.

**mathematical** • Perceiving and understanding numbers and being able to manipulate them to a desired end.

**metaphorical** • Able to understand and make use of visual and verbal figures of speech to suggest a likeness or an analogy in place of literal descriptions, e.g., "heart of gold."

**musical** • Having an interest in or talent for music and/or dance.

**organized** • Able to arrange people, concepts, objects, elements, etc. into coherent relationships with each other.

**planning** • Formulating methods or means to achieve a desired end in advance of taking actions to implement.

**problem solving** • Able to find solutions to difficult problems by reasoning.

**quantitative** • Oriented toward numerical relationships; inclined to know or seek exact measures.

**rational** • Making choices on the basis of reason as opposed to emotion.

**reader** • One who reads often and enjoys it.

**rigorous thinking** • Having a thorough, detailed approach to problem-solving.

**sequential** • Dealing with things and ideas one after another or in order.

**simultaneous** • Able to process more than one type of mental input at a time, e.g. visual, verbal, and musical; able to attend to more than one activity at a time.

**spatial** • Able to perceive, understand and manipulate the relative positions of objects in space.

**spiritual** • Having to do with spirit or soul as apart from the body or material things.

**symbolic** • Able to use and understand objects, marks, and signs as representative of facts and ideas.

**synthesizer** • One who unites separate ideas, elements, or concepts into something new.

**technical** • Able to understand and apply engineering and scientific knowledge.

**teaching/ training** • Able to explain ideas and procedures in a way that people can understand and apply them.

**verbal** • Having good speaking skills; clear and effective with words.

**writer** • One who communicates clearly with the written word and enjoys it.

## BIOGRAPHICAL INFORMATION

Please complete **every** question according to the directions given. Each response, including your answers to questions 2, 3 and 4, provide important data. When directions are not followed or data is incomplete we are unable to process your survey, and must return it to you.

1. Name \_\_\_\_\_ 2. Gender: M  F

3. Educational focus or specialist subject(s) \_\_\_\_\_

4. Occupation or job title \_\_\_\_\_

Describe your work (please be as specific as possible) \_\_\_\_\_

## HANDEDNESS

5. Which picture most closely resembles the way you hold a pencil?

A



B



C



D



6. What is the strength and direction of your handedness?

A  Primary left

B  Primary left  
Some right

C  Both hands equal

D  Primary right,  
some left

E  Primary right

## SCHOOL SUBJECTS

Think back to your performance in the elementary and/or secondary school subjects identified below. Rank order all three subjects on the basis of how well you did: **1** = best; **2** = second best; **3** = third best.

7. \_\_\_ Maths

8. \_\_\_ Foreign language

9. \_\_\_ Native language or mother tongue

Please check that no number is duplicated: The numbers **1**, **2**, and **3** must be used **once** and **only once**. Correct if necessary

## WORK ELEMENTS

Rate each of the work elements below according to your strength in that activity, using the following scale: **5** = work I do best; **4** = work I do well; **3** = neutral; **2** = work I do less well; **1** = work I do least well. Enter the appropriate number next to each element. **Do not use any number more than four times.**

10. \_\_\_ Analytical

16. \_\_\_ Technical Aspects

21. \_\_\_ Innovating

11. \_\_\_ Administrative

17. \_\_\_ Implementation

22. \_\_\_ Teaching/Training

12. \_\_\_ Conceptualising

18. \_\_\_ Planning

23. \_\_\_ Organisation

13. \_\_\_ Expressing Ideas

19. \_\_\_ Interpersonal Aspects

24. \_\_\_ Creative Aspects

14. \_\_\_ Integration

20. \_\_\_ Problem Solving

25. \_\_\_ Financial Aspects

15. \_\_\_ Writing

Please tally: Number of 5's \_\_\_\_\_, 4's \_\_\_\_\_, 3's \_\_\_\_\_, 2's \_\_\_\_\_, 1's \_\_\_\_\_. If there are more than **four** for any category, please redistribute.

## KEY DESCRIPTORS

Select **eight adjectives** which best describe the way you see yourself. Enter a **2** next to each of your **eight** selections. Then change one **2** to a **3** for the adjective which best describes you.

26. \_\_\_ Logical

35. \_\_\_ Emotional

43. \_\_\_ Symbolic

27. \_\_\_ Creative

36. \_\_\_ Spatial

44. \_\_\_ Dominant

28. \_\_\_ Musical

37. \_\_\_ Critical

45. \_\_\_ Holistic

29. \_\_\_ Sequential

38. \_\_\_ Artistic

46. \_\_\_ Intuitive

30. \_\_\_ Synthesizer

39. \_\_\_ Spiritual

47. \_\_\_ Quantitative

31. \_\_\_ Verbal

40. \_\_\_ Rational

48. \_\_\_ Reader

32. \_\_\_ Conservative

41. \_\_\_ Controlled

49. \_\_\_ Simultaneous

33. \_\_\_ Analytical

42. \_\_\_ Mathematical

50. \_\_\_ Factual

34. \_\_\_ Detailed

Please count: seven 2's and one 3? Correct if necessary.

## HOBBIES

Indicate a **maximum of six** hobbies you are actively engaged in. Enter a **3** next to your major hobby, a **2** next to each primary hobby, and a **1** next to each secondary hobby. Enter only **one 3**.

- |                            |                             |                            |
|----------------------------|-----------------------------|----------------------------|
| 51. _____ Arts/Crafts      | 59. _____ Gardening/Plants  | 67. _____ Sewing           |
| 52. _____ Boating          | 60. _____ Golf              | 68. _____ Spectator Sports |
| 53. _____ Camping/Hiking   | 61. _____ Home Improvements | 69. _____ Swimming/Diving  |
| 54. _____ Cards            | 62. _____ Music Listening   | 70. _____ Tennis           |
| 55. _____ Collecting       | 63. _____ Music Playing     | 71. _____ Travel           |
| 56. _____ Cooking          | 64. _____ Photography       | 72. _____ Woodworking      |
| 57. _____ Creative Writing | 65. _____ Reading           | _____ Other _____          |
| 58. _____ Fishing          | 66. _____ Sailing           | _____                      |

Please review: **Only one 3** and **no more than six hobbies**. Correct if necessary.

## ENERGY LEVEL

73. Thinking about your energy level or "drive," select the one that best represents you. Mark box **A**, **B**, or **C**.
- a.  Day person      b.  Day/night person equally      c.  Night person

## MOTION SICKNESS

74. Have you ever experienced motion sickness (nausea, vomiting) in response to vehicular motion (while in a car, boat, plane, bus, train, amusement ride)? Check box **A**, **B**, **C**, or **D** to indicate the number of times.

- a.  None      b.  1-2      c.  3-10      d.  More than 10

75. Can you read while traveling in a car without stomach awareness, nausea, or vomiting?

- a.  Yes      b.  No

## ADJECTIVE PAIRS

For **each paired item** below, check the word or phrase which is more descriptive of yourself. Mark box **A** or **B** for **each pair**, even if the choice is a difficult one. **Do not omit any pairs**.

- |                         |                          |                          |                      |                             |                          |                          |                          |
|-------------------------|--------------------------|--------------------------|----------------------|-----------------------------|--------------------------|--------------------------|--------------------------|
| 76. .... Conservative   | <input type="checkbox"/> | <input type="checkbox"/> | Empathetic           | 88. .... Imaginative        | <input type="checkbox"/> | <input type="checkbox"/> | Sequential               |
| 77. .... Analyst        | <input type="checkbox"/> | <input type="checkbox"/> | Synthesizer          | 89. .... Original           | <input type="checkbox"/> | <input type="checkbox"/> | Reliable                 |
| 78. .... Quantitative   | <input type="checkbox"/> | <input type="checkbox"/> | Musical              | 90. .... Creative           | <input type="checkbox"/> | <input type="checkbox"/> | Logical                  |
| 79. ... Problem-solver  | <input type="checkbox"/> | <input type="checkbox"/> | Planner              | 91. .... Controlled         | <input type="checkbox"/> | <input type="checkbox"/> | Emotional                |
| 80. .... Controlled     | <input type="checkbox"/> | <input type="checkbox"/> | Creative             | 92. .... Musical            | <input type="checkbox"/> | <input type="checkbox"/> | Detailed                 |
| 81. .... Original       | <input type="checkbox"/> | <input type="checkbox"/> | Emotional            | 93. .... Simultaneous       | <input type="checkbox"/> | <input type="checkbox"/> | Empathetic               |
| 82. .... Feeling        | <input type="checkbox"/> | <input type="checkbox"/> | Thinking             | 94. .... Communicator       | <input type="checkbox"/> | <input type="checkbox"/> | Conceptualizer           |
| 83. .... Interpersonal  | <input type="checkbox"/> | <input type="checkbox"/> | Organiser            | 95. .... Technical things   | <input type="checkbox"/> | <input type="checkbox"/> | People-oriented          |
| 84. .... Spiritual      | <input type="checkbox"/> | <input type="checkbox"/> | Creative             | 96. .... Well-organised     | <input type="checkbox"/> | <input type="checkbox"/> | Logical                  |
| 85. .... Detailed       | <input type="checkbox"/> | <input type="checkbox"/> | Holistic             | 97. .... Rigorous Thinking  | <input type="checkbox"/> | <input type="checkbox"/> | Metaphorical Thinking    |
| 86. ... Originate Ideas | <input type="checkbox"/> | <input type="checkbox"/> | Test and Prove Ideas | 98. ... Like Things Planned | <input type="checkbox"/> | <input type="checkbox"/> | Like Things Mathematical |
| 87. ... Warm, Friendly  | <input type="checkbox"/> | <input type="checkbox"/> | Analytical           | 99. .... Technical          | <input type="checkbox"/> | <input type="checkbox"/> | Dominant                 |

Please review: **Did you mark one and only one of each pair?** Correct if necessary.

**INTROVERSION/EXTROVERSION**

100. Mark one box to place yourself on this scale from introvert to extrovert:

**Introvert**          **Extrovert**

**TWENTY QUESTIONS**

Respond to each statement by marking the box in the appropriate column.

	strongly agree ▼	agree ▼	in between ▼	disagree ▼	strongly disagree ▼
101. I feel that a step-by-step method is best for solving problems.					
102. Daydreaming has provided the impetus for the solution of many of my more important problems.					
103. I like people who are most sure of their conclusions.					
104. I would rather be known as a reliable than an imaginative person.					
105. I often get my best ideas when doing nothing in particular.					
106. I rely on hunches and the feeling of "rightness" or "wrongness" when moving toward the solution to a problem					
107. I sometimes get a kick out of breaking the rules and doing things I'm not supposed to do.					
108. Much of what is most important in life cannot be expressed in words.					
109. I'm basically more competitive with others than self-competitive					
110. I would enjoy spending an entire day "alone with my thoughts."					
111. I dislike things being uncertain and unpredictable.					
112. I prefer to work with others in a team effort rather than solo.					
113. It is important for me to have a place for everything and everything in its place.					
114. Unusual ideas and daring concepts interest and intrigue me.					
115. I prefer specific instructions to those which leave many details optional					
116. Know-why is more important than know-how.					
117. Thorough planning and organisation of time are mandatory for solving difficult problems.					
118. I can frequently anticipate the solutions to my problems.					
119. I tend to rely more on my first impressions and feelings when making judgments than on a careful analysis of the situation.					
120. I feel that laws should be strictly enforced.					

**Please review to make sure you have answered all 120 questions.**



**FROM**

You must provide an address and indicate the method of payment in order to receive your HBDI results. Please print.  
Name \_\_\_\_\_ Date \_\_\_\_\_

Company \_\_\_\_\_

Division \_\_\_\_\_

Company address \_\_\_\_\_

\_\_\_\_\_

Daytime phone (\_\_\_\_) \_\_\_\_\_ Evening phone (\_\_\_\_) \_\_\_\_\_ Fax (\_\_\_\_) \_\_\_\_\_

Home address \_\_\_\_\_

\_\_\_\_\_

E-mail address \_\_\_\_\_

Note: There is a fee for processing this survey form.

Payment method (please make a payment into the following account and fax the deposit / electronic transfer document +27-(0)12-807-6002)

Banking details

**Ned Herrmann International Africa Pty (Ltd)**

**ABSA (Hatfield)**

Branch Code : 335545

























Account number 4055061035

**CONFIDENTIAL RESEARCH**

The following questions are not used in scoring the HBDI. However, the answers to these questions are valuable in our

continuing brain dominance research. Skip any questions you wish, but please answer as many as you feel you can.

Indicate the birth order of your brothers, sisters, and self by marking the appropriate symbols with crosses. Then circle the symbol representing yourself.

<b>MALE</b>													<b>MALE</b>
	Oldest	2nd	3rd	4th	5th	6 <sup>th</sup>	7th	8th	9th	10th	11th	12th	
<b>FEMALE</b>													<b>FEMALE</b>

Date of birth \_\_\_\_\_ Citizenship \_\_\_\_\_ Native language \_\_\_\_\_

Ethnicity: Black  White  Asian  Other: \_\_\_\_\_

If you are a parent, please indicate: number of children \_\_\_\_\_ age of oldest \_\_\_\_\_ age of youngest \_\_\_\_\_

Couple status: married  separated  divorced  living together  widow/widower  single

To what extent were you formally educated for the field you are now working in?

not at all  somewhat  to a great degree  fully

Have you filled out the HBDI survey previously? If so, and your name or address has changed since then, please specify the previous name or address

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

How do you see yourself? Please distribute 100 points between these four descriptions:

Rational \_\_\_\_\_ Organised \_\_\_\_\_ Interpersonal \_\_\_\_\_ Imaginative \_\_\_\_\_

Please check the best descriptor indicating your mood or the way you felt at the time you were completing this survey:

happy  enthusiastic  interested  OK  relaxed  indifferent  
 distracted  tired  unhappy